



REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARDS

FOR

AQUACULTURE TECHNICIAN

LEVEL 6



TVET CDACC
P.O. BOX 15745-00100
NAIROBI

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FOREWORD

The provision of quality education and training is fundamental to the Government's overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya's development blueprint, Vision 2030 and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution of Kenya 2010 and this resulted in the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for the purpose of developing a competency-based curriculum for Aquaculture Technician Level 6. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for the Agriculture sector's growth and sustainable development.

**PRINCIPAL SECRETARY
VOCATIONAL AND TECHNICAL TRAINING
MINISTRY OF EDUCATION**

PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 and Sessional Paper No. 14 of 2012 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET in order to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Aquaculture Sector Skills Advisory Committee (SSAC), German International Cooperation and Ministry of Agriculture, Livestock and Fisheries have developed these Occupational Standards for an Aquaculture Technician. TVET CDACC in conjunction with Micro Enterprises Support Programme Trust (MESPT) reviewed these Occupational Standards and incorporated Food Safety. These standards will be the basis for development of competency-based curriculum for Aquaculture Management level 6.

The Occupational Standards are designed and organized with clear Performance Criteria for each element of a Unit of Competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Aquaculture SSAC, expert workers and all those who participated in the development and review of these Occupational Standards.

**CHAIRMAN
TVET CDACC**

ACKNOWLEDGMENT

These Occupational Standards were developed through combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVETCDACC) for providing guidance on the development of these Standards. My gratitude goes to Aquaculture Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the validation of these Standards.

My gratitude also goes to NEPAD Planning and Coordinating Agency (NPCA) of the Africa Union Commission and German Ministry of Economic Cooperation and Development (BMZ) through its implementing agency German International Cooperation (GIZ) GmbH which enabled the development of these Standards through the CAADP ATVET project.

I also appreciate the office of the National Coordinator of GIZ CAADP ATVET Project which was instrumental in the cooperation between the project team, Ministry of Agriculture, Livestock and Fisheries (MoALF) and Ministry of Education.

Much gratitude goes to Micro Enterprises Support Program Trust (MESPT) who initiated the review process and the incorporation of Food Safety in the Occupational Standards. I acknowledge the Danish International Development Agency (DANIDA) and the European Union (EU) who sponsored the review process.

I acknowledge all other institutions which in one way or another contributed to the development of these Standards.

CHAIRMAN

AQUACULTURE SECTOR SKILLS ADVISORY COMMITTEE

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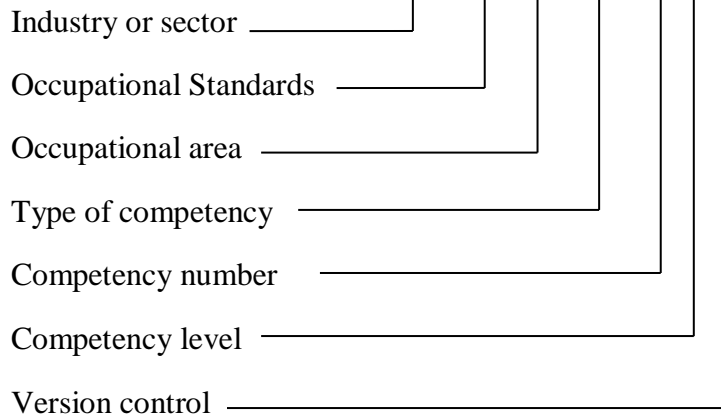
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ABBREVIATIONS AND ACRONYMS

AQ	Aquaculture
AT	Aquaculture Technician
ATVET	Agricultural Technical and Vocational Education and Training
BC	Basic Competency
CAADP	Comprehensive Africa Agricultural Development Programme
CDACC	Curriculum Development, Assessment and Certification Council
DANIDA	Danish International Development Agency
CR	Core Competency
GIZ	German International Cooperation
ISO	International Standards Organization
MESPT	Micro Enterprises Support Programme Trust
NEMA	National Environment Management Authority
OS	Occupational Standards
PPE	Personal Protective Equipment
CBET	
SSAC	Sector Skills Advisory Committee
TVET	
RAS	Recirculating Aquaculture System
PPE	
HACCP	Hazard Analysis Critical Control Points ()

KEY TO UNIT CODE

AQ /OS /AT /BC/ 01/6/B



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OVERVIEW

Aquaculture Technician level 6 qualification consists of competencies that an individual must achieve to set up fish farm, produce fish feeds, operate fish hatchery, produce grow out fish, handle harvested fish, set up small scale fish hatchery unit, set up recirculating aquaculture system (RAS) and manage a cage farm.

The Units of Competency comprising Aquaculture Technician level 6 qualification include the following:

BASIC UNITS OF COMPETENCY

Unit Code	Unit of Title
AQ/OS/AT/BC/01/6/B	Demonstrate communication skills
AQ/OS/AT/BC/02/6/B	Demonstrate numeracy skills
AQ/OS/AT/BC/03/6/B	Demonstrate digital literacy
AQ/OS/AT/BC/04/6/B	Demonstrate entrepreneurial skills
AQ/OS/AT/BC/05/6/B	Demonstrate employability skills
AQ/OS/AT/BC/06/6/B	Demonstrate environmental literacy
AQ/OS/AT/BC/07/6/B	Demonstrate occupational safety and health practices

CORE UNITS COMPETENCY

AQ/OS/AT/CR/01/6/B	Set Up Fish Farm
AQ/OS/AT/CR/02/6/B	Produce Fish Feeds
AQ/OS/AT/CR/03/6/B	Manage Fish Hatchery
AQ/OS/AT/CR/04/6/B	Produce Grow Out Fish
AQ/OS/AT/CR/05/6/B	Handle Harvested Fish
AQ/OS/AT/CR/06/6/B	Set Up Small Scale Fish Hatchery Unit
AQ/OS/AT/CR/07/6/B	Set Up Recirculating Aquaculture System (RAS)
AQ/OS/AT/CR/08/6/B	Manage Fish Cage Farm

BASIC UNITS OF COMPETENCY

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DEMONSTRATE COMMUNICATION SKILLS

UNIT CODE: AQ/OS/AT/BC/01/6/B

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, developing communication strategies, establishing and maintaining communication pathways, conducting interviews, facilitating group discussion and representing the organization.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Meet communication needs of clients and colleagues	1.1 Specific communication needs of clients and colleagues are identified and met based on workplace requirements 1.2 Different communication approaches are identified and applied according to clients' needs 1.3 Conflict is identified and addressed as per the standards of the organization
2. Develop communication strategies	2.1 Strategies for effective internal and external dissemination of information are developed as per organization's requirements 2.2 Special communication needs are considered in developing strategies according workplace procedures 2.3 <i>Communication strategies</i> are analyzed, evaluated and revised based the workplace needs
3. Establish and maintain communication pathways	3.1 Pathways of communication are established as per organization policy 3.2 Pathways are maintained and reviewed according to organization procedures
4. Promote use of communication strategies	4.1 Information is provided to all areas of the organization as per strategy requirements 4.2 Effective communication techniques are articulated and modeled according work requirements 4.3 Personnel are given guidance about adapting communication strategies as per organization procedures

5. Conduct interview	<p>5.1 A range of appropriate communication strategies are employed in <i>interview situations</i> based on the workplace requirements</p> <p>5.2 Records of interviews are made and maintained in accordance with organizational procedures</p> <p>5.3 Effective questioning, listening and nonverbal communication techniques are used as per needs</p>
6. Facilitate group discussion	<p>6.1 Mechanisms to enhance <i>effective group interaction</i> are identified and implemented according to workplace requirements</p> <p>6.2 Strategies to encourage group participation are identified and used as per organizations' procedures</p> <p>6.3 Meetings objectives and agenda are set and followed based on workplace requirements</p> <p>6.4 Relevant information is provided and feedback obtained according to set protocols</p> <p>6.5 Evaluation of group communication strategies is undertaken in accordance with workplace guidelines</p> <p>6.6 Specific communication needs of individuals are identified and addressed as per individual needs</p>
7. Represent the organization	<p>5.1 Relevant presentation are researched and presented based on internal or external communication forums requirements</p> <p>5.2 Presentation is delivered in a clear and sequential manner as per the predetermined time</p> <p>5.3 Presentation is made as per appropriate media</p> <p>5.4 Difference views are respected based on workplace procedures</p> <p>5.5 Written communication is done as per organizational standards</p> <p>5.6 Inquiries are responded according to organizational standard</p>

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
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<p>1. Communication strategies may include but not limited to:</p>	<ul style="list-style-type: none"> • Language switch • Comprehension check • Repetition • Asking confirmation • Paraphrase • Clarification request • Translation • Restructuring • Approximation • Generalization
<p>2. Effective group interaction may include but not limited to:</p>	<ul style="list-style-type: none"> • Identifying and evaluating what is occurring within an interaction in a nonjudgmental way • Using active listening • Making decision about appropriate words, behavior • Putting together response which is culturally appropriate • Expressing an individual perspective • Expressing own philosophy, ideology and background and exploring impact with relevance to communication
<p>3. Situations may include but not limited to:</p>	<ul style="list-style-type: none"> • Establishing rapport • Eliciting facts and information • Facilitating resolution of issues • Developing action plans • Diffusing potentially difficult situations

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Communication
- Active listening
- Interpretation
- Negotiation
- Writing

Required Knowledge

The individual needs to demonstrate knowledge of:

- Communication process
- Dynamics of groups
- Styles of group leadership
- Key elements of communications strategy

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Developed communication strategies to meet the organization requirements and applied in the workplace 1.2 Established and maintained communication pathways for effective communication in the workplace 1.3 Used communication strategies involving exchanges of complex oral information
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Direct observation 3.2 Oral questioning 3.3 Written texts
4. Context of Assessment	Competency may be assessed 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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DEMONSTRATE NUMERACY SKILLS

UNIT CODE: AQ/OS/AT/BC/02/6/B

UNIT DESCRIPTION

This unit describes the competencies required to demonstrate numeracy skills. It involves; applying a wide range of mathematical calculations for work; applying ratios, rates and proportions to solve problems; estimating, measuring and calculating measurement for work; using detailed maps to plan travel routes for work; using geometry to draw and construct 2D and 3D shapes for work; collecting, organizing and interpreting statistical data; using routine formula and algebraic expressions for work and using common functions of a scientific calculator.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range.</i>
1. Apply a wide range of mathematical calculations for work	1.1 Mathematical information embedded in a range of workplace tasks and texts is extracted as per workplace procedures. 1.2 Mathematical information is interpreted and comprehended as per job specifications 1.3 A range of mathematical and problem solving processes are selected and used as per job specification 1.4 Different forms of fractions, decimals and percentages are flexibly used as per SOPs 1.5 Calculation performed with positive and negative numbers as per SOPs 1.6 Numbers are expressed as powers and roots and are used in calculations as per SOPs 1.7 Calculations done using routine formulas as per SOPs 1.8 Estimation and assessment processes are used to check outcome as per workplace procedures 1.9 Mathematical language is used to discuss and explain the processes, results and implications of the task as per workplace procedures

<p>2. Use and apply ratios, rates and proportions for work</p>	<p>2.1 Information regarding ratios, rates and proportions extracted from a range of workplace tasks and texts as per SOPs</p> <p>2.2 Mathematical information related to ratios, rate and proportions is analysed as per SOPs</p> <p>2.3 Problem solving processes are used to undertake the task as per workplace procedures</p> <p>2.4 Equivalent ratios and rates are simplified as per SOPs</p> <p>2.5 Quantities are calculated using ratios, rates and proportions as per SOPs</p> <p>2.6 Graphs, charts or tables are constructed to represent ratios, rates and proportions as per SOPs</p> <p>2.7 The outcomes reviewed and checked as per job specifications</p> <p>2.8 Information is record using mathematical language and symbols as per workplace procedures</p>
<p>3. Estimate, measure and calculate measurement for work</p>	<p>3.1 Measurement information embedded in workplace texts and tasks are extracted and interpreted as per job specifications</p> <p>3.2 Appropriate workplace measuring equipment are identified and selected as per job specifications</p> <p>3.3 Accurate measurements are estimated and made as per SOPs</p> <p>3.4 The area of 2D shapes including compound shapes are calculated as per SOPs</p> <p>3.5 The volume of 3D shapes is calculated using relevant formulas as per SOPs</p> <p>3.6 Sides of right angled triangles are calculated using Pythagoras' theorem as per SOPs</p> <p>3.7 conversions are perform between units of measurement as per job specification</p> <p>3.8 Problem solving processes are used to undertake the task as per workplace Procedures</p> <p>3.9 The measurement outcomes are reviewed and checked as per workplace procedures</p> <p>3.10 Information is recorded using mathematical language and symbols appropriate for the task as per workplace procedures</p>

<p>4. Use detailed maps to plan travel routes for work</p>	<p>4.1 Different types of maps are identified and interpreted as per job requirements</p> <p>4.2 Key features of maps are identified as per job requirements</p> <p>4.3 Scales are identified and interpreted as per job requirements</p> <p>4.4 Scales are applied to calculate actual distances</p> <p>4.5 Positions or locations are determined using directional information as per job requirements</p> <p>4.6 Routes are planned by determining directions and calculating distances, speeds and times as per job requirements</p> <p>4.7 Information is gathered and identified and relevant factors related to planning a route checked as per job requirements</p> <p>4.8 Relevant equipment is select and checked for accuracy and operational effectiveness as per job requirements</p> <p>4.9 Task is planned and recorded using specialized mathematical language and symbols appropriate for the task as per job requirements</p>
<p>5. Use geometry to draw 2D shapes and construct 3D shapes for work</p>	<p>5.1 A range of 2D shapes and 3D shapes and their uses in work contexts is identified as per job specifications</p> <p>5.2 Features of 2D and 3D shapes are named and described as per job specifications</p> <p>5.3 Types of angles in 2D and 3D shapes are identified as per job specifications</p> <p>5.4 Angles are drawn, estimated and measured using geometric instruments as per job requirements</p> <p>5.5 Angle properties of 2D shapes are named and identified as per SOPs</p> <p>5.6 Angle properties are used to evaluate unknown angles in shapes as per SOPs</p> <p>5.7 Properties of perpendicular and parallel lines are applied to shapes as per SOPs</p> <p>5.8 Understanding and use of symmetry is demonstrated as per SOPs</p>

	<p>5.9 Understanding and use of similarity is demonstrated as per SOPs</p> <p>5.10 The workplace tasks and mathematical processes required are identified as per workplace procedures</p> <p>5.11 2D shapes is drawn for work as per job specification</p> <p>5.12 3D shapes is constructed for work as per job specification</p> <p>5.13 The outcomes are reviewed and checked as per workplace procedures</p> <p>5.14 Specialized mathematical language and symbols appropriate for the task are used as per SOPs</p>
<p>6. Collect, organize, and interpret statistical data for work</p>	<p>6.1 Workplace issue requiring investigation are identified as per workplace procedures</p> <p>6.2 Audience / population / sample unit is determined as per workplace procedures as per workplace procedures</p> <p>6.3 Data to be collected is identified as per workplace procedures</p> <p>6.4 Data collection method is selected as per workplace procedures</p> <p>6.5 Appropriate statistical data is collected and organized as per SOPs</p> <p>6.6 Data is illustrated in appropriate formats as per SOPs</p> <p>6.7 The effectiveness of different types of graphs are compared as per SOPs</p> <p>6.8 The summary statistics for collected data is calculated as per SOPs</p> <p>6.9 The results / findings are interpreted as per SOPs</p> <p>6.10 Data is checked to ensure that it meets the expected results and content as per workplace procedures</p> <p>6.11 Information from the results including tables, graphs and summary statistics is extracted and interpreted as per workplace procedure</p> <p>6.12 Mathematical language and symbols are used to report results of investigation as per workplace procedure</p>

<p>7. Use routine formula and algebraic expressions for work</p>	<p>7.1 Understanding of informal and symbolic notation, representation and conventions of algebraic expressions is demonstrated as per SOPs</p> <p>7.2 Simple algebraic expressions and equations are developed as per job specification</p> <p>7.3 Operate on algebraic expressions as per job requirement</p> <p>7.4 Algebraic expressions are simplified as per job requirement</p> <p>7.5 Substitution into simple routine equations is done as per SOPs</p> <p>7.6 Routine formulas used for work tasks are identified and comprehended as per SOPs</p> <p>7.7 Routine formulas are evaluate by substitution as per SOPs</p> <p>7.8 Routine formulas transposed as per SOPs</p> <p>7.9 Appropriate formulas are identified and used for work related tasks as per workplace procedures</p> <p>7.10 Outcomes are checked and result of calculation used as per workplace procedures</p>
<p>8. Use common functions of a scientific calculator for work</p>	<p>8.1 Required numerical information to perform tasks is located as per job specification</p> <p>8.2 The order of operations and function keys necessary to solve mathematical calculation are determined as per job specification</p> <p>8.3 Function keys on a scientific calculator are identified and used as per SOPs</p> <p>8.4 Estimations are referred to check reasonableness of problem solving process as per workplace procedures</p> <p>8.5 Appropriate mathematical language, symbols and conventions are used to report results as per workplace procedures</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. 2D shapes may include but not limited may include but not limited to:	<ul style="list-style-type: none"> • Triangles • Square • Rectangle • Triangle

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Measuring
- Logical thinking
- Computing
- Drawing of graphs
- Applying mathematical formulas
- Analytical

Required knowledge

The individual needs to demonstrate knowledge of:

- Types of common shapes
- Differentiation between two dimensional shapes / objects
- Formulae for calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Fundamental operations (addition, subtraction, division, multiplication)
- Rounding techniques
- Types of fractions
- Different types of tables and graphs
- Meaning of graphs, such as increasing, decreasing, and constant value
- Preparation of basic data, tables & graphs

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1. 1Developed communication strategies to meet the organization requirements and applied in the workplace 1. 2Established and maintained communication pathways for effective communication in the workplace 1. 3 Used communication strategies involving exchanges of complex oral information
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
<p>3. Methods of Assessment</p>	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
<p>4. Context of Assessment</p>	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
<p>5. Guidance information for assessment</p>	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE DIGITAL LITERACY

UNIT CODE: AQ/OS/AT/BC/03/6/B

UNIT DESCRIPTION

This unit describes competencies required to demonstrate digital literacy. It involves, identifying computer software and hardware, applying security measures to data, hardware, and software in automated environment, applying computer software in solving task, applying internet and email in communication at workplace, applying desktop publishing in official assignments and preparing presentation packages.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Identify appropriate computer software and hardware	1.1 Concepts of ICT are determined in accordance with computer equipment 1.2 Classifications of computers are determined in accordance with manufacturers specification 1.3 Appropriate computer software is identified according to manufacturer's specification 1.4 Appropriate computer hardware is identified according to manufacturer's specification 1.5 Functions and commands of operating system are determined in accordance with manufacturer's specification
2. Apply security measures to data, hardware, software in automated environment	2.1 <i>Data security and privacy are classified</i> in accordance with the prevailing technology 2.2 <i>Security threats</i> reidentified <i>and control measures</i> are applied in accordance with laws governing protection of ICT 2.3 Computer threats and crimes are detected in accordance to Information Management security guidelines 2.4 Protection against computer crimes is undertaken in accordance with laws governing protection of ICT

<p>3. Apply computer software in solving tasks</p>	<p>3.1 Word processing concepts are applied in resolving workplace tasks, report writing and documentation as per the job requirements</p> <p>3.2 Word processing utilities are applied in accordance with workplace procedures</p> <p>3.3 Worksheet layout is prepared in accordance with work procedures</p> <p>3.4 Worksheet is build and data manipulated in the worksheet in accordance with workplace procedures</p> <p>3.5 Continuous data manipulated on worksheet is undertaken in accordance with work requirements</p> <p>3.6 Database design and manipulation is undertaken in accordance with office procedures</p> <p>3.7 Data sorting, indexing, storage, retrieval and security is provided in accordance with workplace procedures</p>
<p>4. Apply internet and email in communication at workplace</p>	<p>4.1 Electronic mail addresses are opened and applied in workplace communication in accordance with office policy</p> <p>4.2 Office internet functions are defined and executed in accordance with office procedures</p> <p>4.3 Network configuration is determined in accordance with office operations procedures</p> <p>4.4 Official World Wide Web is installed and managed according to workplace procedures</p>
<p>5. Apply Desktop publishing in official assignments</p>	<p>5.1 Desktop publishing functions and tools are identified in accordance with manufactures specifications</p> <p>5.2 Desktop publishing tools are developed in accordance with work requirements</p> <p>5.3 Desktop publishing tools are applied in accordance with workplace requirements</p> <p>5.4 Typeset work is enhanced in accordance with workplace standards</p>
<p>6. Prepare presentation packages</p>	<p>6.1 Types of presentation packages are identified in accordance with office requirements</p> <p>6.2 Slides are created and formulated in accordance with workplace procedures</p> <p>6.3 Slides are edited and run in accordance with work procedures</p>

	6.4 Slides and handouts are printed according to work requirements
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RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Appropriate computer hardware may include but not limited to:	Collection of physical parts of a computer system such as; <ul style="list-style-type: none"> • Computer case, monitor, keyboard, and mouse • All the parts inside the computer case, such as the hard disk drive, motherboard and video card
2. Data security and privacy may include but not limited to:	<ul style="list-style-type: none"> • Confidentiality of data • Cloud computing • Integrity -but-curious data surfing
3. Security and control measures may include but not limited to:	<ul style="list-style-type: none"> • Counter measures against cyber terrorism • Risk reduction • Cyber threat issues • Risk management • Pass-wording
4. Security threats may include but not limited to:	<ul style="list-style-type: none"> • Cyber terrorism • Hacking

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Analytical skills
- Interpretation
- Typing
- Communication

- Computing (applying fundamental operations such as addition, subtraction, division and multiplication)
- Using calculator
- Basic ICT skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Software concept
- Functions of computer software and hardware
- Data security and privacy
- Computer security threats and control measures
- Technology underlying cyber-attacks and networks
- Cyber terrorism
- Computer crimes
- Detection and protection of computer crimes
- Laws governing protection of ICT
- Word processing;
 - ✓ Functions and concepts of word processing.
 - ✓ Documents and tables creation and manipulations
 - ✓ Mail merging
 - ✓ Word processing utilities
- Spread sheets;
 - ✓ Meaning, formulae, function and charts, uses and layout
 - ✓ Data formulation, manipulation and application to cells
 - ✓
- Database;
 - ✓ Database design, data manipulation, sorting, indexing, storage retrieval and security
- Desktop publishing;
 - ✓ Designing and developing desktop publishing tools
 - ✓ Manipulation of desktop publishing tools
 - ✓ Enhancement of typeset work and printing documents
- Presentation Packages;
 - ✓ Types of presentation Packages
 - ✓ Creating, formulating, running, editing, printing and presenting slides and handouts
- Networking and Internet;

- ✓ Computer networking and internet.
- ✓ Electronic mail and world wide web
- Emerging trends and issues in ICT;
 - ✓ Identify and integrate emerging trends and issues in ICT
 - ✓ Challenges posed by emerging trends and issues

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified and controlled security threats 1.2 Detected and protected computer crimes 1.3 Applied word processing in office tasks 1.4 Designed, prepared work sheet and applied data to the cells in accordance to workplace procedures 1.5 Opened electronic mail for office communication as per workplace procedure 1.6 Installed internet and World Wide Web for office tasks in accordance with office procedures 1.7 Integrated emerging issues in computer ICT applications 1.8 Applied laws governing protection of ICT
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
<p>4. Context of Assessment</p>	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment

5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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DEMONSTRATE UNDERSTANDING OF ENTREPRENEURSHIP

UNIT CODE : AQ/OS/AT/BC/04/6/B

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate understanding of entrepreneurship. It involves demonstrating understanding of an entrepreneur, entrepreneurship, and self-employment, identifying entrepreneurship opportunities, creating entrepreneurial awareness, applying entrepreneurial motivation, developing business innovative strategies and developing business plan.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
1. Demonstrate understanding of an Entrepreneur	<ol style="list-style-type: none">1. 1Entrepreneurs and Business persons are distinguished as per principles of entrepreneurship1. 2<i>Types of entrepreneurs</i> are identified as per principles of entrepreneurship1. 3Ways of becoming an Entrepreneur are identified as per principles of Entrepreneurship1. 4<i>Characteristics of Entrepreneurs</i> are identified as per principles of Entrepreneurship1. 5Factors affecting Entrepreneurship development are explored as per principles of Entrepreneurship
2. Demonstrate understanding of Entrepreneurship and self-employment	<ol style="list-style-type: none">2. 1Entrepreneurship and self-employment are distinguished as per principles of entrepreneurship2. 2Importance of self-employment is analysed based on business procedures and strategies2. 3<i>Requirements for entry into self-employment</i> are identified according to business procedures and strategies2. 4Role of an Entrepreneur in business is determined according to business procedures and strategies

	<p>2. 5 Contributions of Entrepreneurs to National development are identified as per business procedures and strategies</p> <p>2. 6 Entrepreneurship culture in Kenya is explored as per business procedures and strategies</p> <p>2. 7 Born or made Entrepreneurs are distinguished as per entrepreneurial traits</p>
<p>3. Identify Entrepreneurship opportunities</p>	<p>3.1 Sources of business ideas are identified as per business procedures and strategies</p> <p>3.2 Business ideas and opportunities are generated as per business procedures and strategies</p> <p>3.3 Business life cycle is analysed as per business procedures and strategies</p> <p>3.4 Legal aspects of business are identified as per procedures and strategies</p> <p>3.5 Product demand is assessed as per market strategies</p> <p>3.6 Types of business environment are identified and evaluated as per business procedures</p> <p>3.7 Factors to consider when evaluating business environment are explored based on business procedure and strategies</p> <p>3.8 Technology in business is incorporated as per best practice</p>
<p>4. Create entrepreneurial awareness</p>	<p>4.1 Forms of businesses are explored as per business procedures and strategies</p> <p>4.2 Sources of business finance are identified as per business procedures and strategies</p> <p>4.3 Factors in selecting source of business finance are identified as per business procedures and strategies</p> <p>4.4 Governing policies on Small Scale Enterprises (SSEs) are determined as per business procedures and strategies</p>

	4.5 Problems of starting and operating SSEs are explored as per business procedures and strategies
5. Apply entrepreneurial motivation	<p>5.1 Internal and external motivation factors are determined in accordance with motivational theories</p> <p>5.2 Self-assessment is carried out as per entrepreneurial orientation</p> <p>5.3 Effective communications are carried out in accordance with communication principles</p> <p>5.4 Entrepreneurial motivation is applied as per motivational theories</p>
6. Develop innovative business strategies	<p>6.1 Business innovation strategies are determined in accordance with the organization strategies</p> <p>6.2 Creativity in business development is demonstrated in accordance with business strategies</p> <p>6.3 Innovative business strategies are developed as per business principles</p> <p>6.4 Linkages with other entrepreneurs are created as per best practice</p> <p>6.5 ICT is incorporated in business growth and development as per best practice</p>
7. Develop Business Plan	<p>7.1 Identified Business is described as per business procedures and strategies</p> <p>7.2 Marketing plan is developed as per business plan format</p> <p>7.3 Organizational/Management plan is prepared in accordance with business plan format</p> <p>7.4 Production/operation plan in accordance with business plan format</p> <p>7.5 Financial plan is prepared in accordance with the business plan format</p> <p>7.6 Executive summary is prepared in accordance with business plan format</p>

	7.7 Business plan is presented as per best practice
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RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
1. Types of entrepreneurs may include but not limited to:	<ul style="list-style-type: none"> • Innovators • Imitators • Craft • Opportunistic • Speculators
2. Characteristics of Entrepreneurs may include but not limited to:	<ul style="list-style-type: none"> • Creative • Innovative • Planner • Risk taker • Networker • Confident • Flexible • Persistent • Patient • Independent • Future oriented • Goal oriented
3. Requirements for entry into self-employment may include but not limited to	<ul style="list-style-type: none"> • Technical skills • Management skills • Entrepreneurial skills • Resources • Infrastructure
4. Internal and external motivation may include but not limited to:	<ul style="list-style-type: none"> • Interest • Passion • Freedom

	<ul style="list-style-type: none"> • Prestige • Rewards • Punishment • Enabling environment • Government policies
5. Business environment may include but not limited to:	<ul style="list-style-type: none"> • External • Internal • Intermediate
6. Forms of businesses may include but not limited to:	<ul style="list-style-type: none"> • Sole proprietorship • Partnership • Limited companies • Cooperatives
7. Governing policies may include but not limited to:	<ul style="list-style-type: none"> • Increasing scope for finance • Promoting cooperation between entrepreneurs and private sector • Reducing regulatory burden on entrepreneurs • Developing IT tools for entrepreneurs
8. Innovative business strategies may include but not limited to:	<ul style="list-style-type: none"> • New products • New methods of production • New markets • New sources of supplies • Change in industrialization

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Analytical
- Management
- Problem-solving
- Root-cause analysis
- Communication

Required Knowledge

The individual needs to demonstrate knowledge of:

- Decision making
- Business communication
- Change management
- Competition
- Risk
- Net working
- Time management
- Leadership
- Factors affecting entrepreneurship development
- Principles of Entrepreneurship
- Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
- Conflict resolution
- Health, safety and environment (HSE) principles and requirements
- Customer care strategies
- Basic financial management
- Business strategic planning
- Impact of change on individuals, groups and industries
- Government and regulatory processes
- Local and international market trends
- Product promotion strategies
- Market and feasibility studies
- Government and regulatory processes
- Local and international business environment
- Relevant developments in other industries
- Regional/ County business expansion strategies

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	1. 1Assessment requires evidence that the candidate: 1. 2Distinguished entrepreneurs and businesspersons correctly 1. 3Identified ways of becoming an entrepreneur appropriately
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	<ol style="list-style-type: none"> 1. 4 Explored factors affecting entrepreneurship development appropriately 1. 5 Analysed importance of self-employment accurately 1. 6 Identified requirements for entry into self-employment correctly 1. 7 Identified sources of business ideas correctly 1. 8 Generated Business ideas and opportunities correctly 1. 9 Analysed business life cycle accurately 1. 10 Identified legal aspects of business correctly 1. 11 Assessed product demand accurately 1. 12 Determined Internal and external motivation factors appropriately 1. 13 Carried out communications effectively 1. 14 Identified sources of business finance correctly 1. 15 Determined Governing policy on small scale enterprise appropriately 1. 16 Explored problems of starting and operating SSEs effectively 1. 17 Developed Marketing, Organizational/Management, Production/Operation and Financial plans correctly 1. 18 Prepared executive summary correctly 1. 19 Determined business innovative strategies appropriately 1. 20 Presented business plan effectively
2. Resource Implications	<p>The following resources should be provided:</p> <ol style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place
3. Methods of Assessment	<ol style="list-style-type: none"> 3.1 Written tests 3.2 Oral questions 3.3 Third party report 3.4 Interviews 3.5 Portfolio of Evidence

4. Context of Assessment	Competency may be assessed 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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DEMONSTRATE EMPLOYABILITY SKILLS

UNIT CODE: AQ/OS/ATBC/05/6/B

UNIT DESCRIPTION

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading a workplace team, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing ethical performance.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct self-management	1.1 Personal vision, mission and goals are formulated based on potential and in relation to organization objectives 1.2 Emotional intelligence is demonstrated as per workplace requirements. 1.3 Individual performance is evaluated and monitored according to the agreed targets. 1.4 Assertiveness is developed and maintained based on the requirements of the job. 1.5 Accountability and responsibility for own actions are demonstrated based on workplace instructions. 1.6 Self-esteem and a positive self-image are developed and maintained based on values. 1.7 Time management, attendance and punctuality are observed as per the organization policy. 1.8 Goals are managed as per the organization's objective 1.9 Self-strengths and weaknesses are identified based on personal objectives

<p>2. Demonstrate interpersonal communication</p>	<p>2.1 Writing skills are demonstrated as per communication policy</p> <p>2.2 Negotiation and persuasion skills are demonstrated as per communication policy</p> <p>2.3 Internal and external stakeholders' needs are identified and interpreted as per the communication policy</p> <p>2.4 Communication networks are established based on workplace policy</p> <p>2.5 Information is shared as per communication policy</p>
<p>3. Demonstrate critical safe work habits</p>	<p>3.1 Stress is managed in accordance with workplace policy.</p> <p>3.2 Punctuality and time consciousness is demonstrated in line with workplace policy.</p> <p>3.3 Personal objectives are integrated with organization goals based on organization's strategic plan.</p> <p>3.4 Resources are utilized in accordance with workplace policy.</p> <p>3.5 Work priorities are set in accordance to workplace goals and objectives.</p> <p>3.6 Leisure time is recognized and utilized in line with personal objectives.</p> <p>3.7 Drugs and substances of abuse are identified and avoided based on workplace policy.</p> <p>3.8 HIV and AIDS prevention awareness is demonstrated in line with workplace policy.</p> <p>3.9 Safety consciousness is demonstrated in the workplace based on organization safety policy.</p> <p>3.10 Emerging issues are identified and dealt with in accordance with organization policy.</p>
<p>4. Lead a workplace team</p>	<p>4.1 Performance targets for the team are set based on organization's objectives</p> <p>4.2 Duties are assigned in accordance with the organization policy.</p> <p>4.3 Forms of communication in a team are established according to organization's policy.</p> <p>4.4 Team performance is evaluated based on set targets as per workplace policy.</p>

	<p>4.5 Conflicts are resolved between team members in line with organization policy.</p> <p>4.6 Gender related issues are identified and mainstreamed in accordance workplace policy.</p> <p>4.7 Human rights and fundamental freedoms are identified and respected as Constitution of Kenya 2010.</p> <p>4.8 Healthy relationships are developed and maintained in line with workplace.</p>
5. Plan and organize work	<p>5.1 Work plans are prepared based on activities and budget.</p> <p>5.2 Assigned tasks are interpreted and expectations identified as per the workplace instructions.</p> <p>5.3 Task occupational safety and health requirements are identified and observed regulations.</p> <p>5.4 Work resources are identified, mobilized, allocated and utilized based on organization work plans.</p> <p>5.5 Work activities are monitored and evaluated in line with work plans and workplace policy.</p> <p>5.6 Work plans are reviewed based on target and available resources.</p>
6. Maintain professional growth and development	<p>6.1 Personal training needs are identified and assessed in line with the requirements of the job.</p> <p>6.2 Training and career opportunities are identified and utilized based on job requirements.</p> <p>6.3 Resources for training are mobilized and allocated based organizations and individual skills needs.</p> <p>6.4 Licensees and certifications relevant to job and career are obtained and renewed as per policy.</p> <p>6.5 Work priorities and personal commitments are balanced and managed based on requirements of the job and personal objectives.</p> <p>6.6 Recognitions are sought as proof of career advancement in line with professional requirements.</p>
7. Demonstrate workplace learning	<p>7.1 Learning opportunities are sought and managed based on job requirement and organization policy.</p> <p>7.2 Improvement in performance is demonstrated based on courses attended.</p> <p>7.3 Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job</p>

	<p>7.4 Time and effort is invested in learning new skills based on job requirements</p> <p>7.5 Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy.</p> <p>7.6 New systems are developed and maintained in accordance with the requirements of the job.</p> <p>7.7 Awareness of personal role in workplace <i>innovation</i> is demonstrated based on requirements of the job.</p>
8. Demonstrate problem solving skills	<p>8.1 Creative, innovative and practical solutions are developed based on the problem</p> <p>8.2 Independence and initiative in identifying and solving problems is demonstrated based on requirements of the job.</p> <p>8.3 Team problems are solved as per the workplace guidelines</p> <p>8.4 Problem solving strategies are applied as per the workplace guidelines</p> <p>8.5 Problems are analyzed and assumptions tested as per the context of data and circumstances</p>
9. Manage ethical performance	<p>9.1 Policies and guidelines are observed as per the workplace requirements</p> <p>9.2 Self-worth and professionalism is exercised in line with personal goals and organizational policies</p> <p>9.3 Code of conduct is observed as per the workplace requirements</p> <p>9.4 Integrity is demonstrated as per legal requirement</p>

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
1. Drug and substance abuse may include but not limited to:	<p>Commonly abused</p> <ul style="list-style-type: none"> • Alcohol • Tobacco • Miraa

	<ul style="list-style-type: none"> • Over-the-counter drugs • Cocaine • Bhang • Glue
2. Feedback may include but not limited to:	<ul style="list-style-type: none"> • Verbal • Written • Informal • Formal
3. Relationships may include but not limited to:	<ul style="list-style-type: none"> • Man/Woman • Trainer/trainee • Employee/employer • Client/service provider • Husband/wife • Boy/girl • Parent/child • Sibling relationships
4. Forms of communication may include but not limited to:	<ul style="list-style-type: none"> • Written • Visual • Verbal • Non verbal • Formal and informal
5. Team may include but not limited to:	<ul style="list-style-type: none"> • Small work group • Staff in a section/department • Inter-agency group
6. Personal growth may include but not limited to:	<ul style="list-style-type: none"> • Growth in the job • Career mobility • Gains and exposure the job gives • Net workings • Benefits that accrue to the individual as a result of noteworthy performance
7. Personal objectives may include but not limited to:	<ul style="list-style-type: none"> • Long term • Short term • Broad • Specific

8. Trainings and career opportunities may includes but not limited to	<ul style="list-style-type: none"> • Participation in training programs • Serving as Resource Persons in conferences and workshops
9. Resource may include may but not limited to:	<ul style="list-style-type: none"> • Human • Financial • Technology
10. Innovation may include but not limited to:	<ul style="list-style-type: none"> • New ideas • Original ideas • Different ideas • Methods/procedures • Processes • New tools
11. Emerging issues may include but not limited to:	<ul style="list-style-type: none"> • Terrorism • Social media • National cohesion • Open offices
12. Range of media for learning may include but not limited to:	<ul style="list-style-type: none"> • Mentoring • peer support and networking • IT and courses

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Interpersonal
- Communication
- Critical thinking
- Organisational
- Negotiation
- Monitoring
- Evaluation
- Record keeping
- Problem solving
- Decision Making
- Resource utilization

- Resource mobilization

Required Knowledge

The individual needs to demonstrate knowledge of:

- Work values and ethics
- Company policies
- Company operations, procedures and standards
- Occupational Health and safety procedures
- Fundamental rights at work
- Workplace communication
- Concept of time
- Time management
- Decision making
- Types of resources
- Work planning
- Organizing work
- Monitoring and evaluation
- Record keeping
- Gender mainstreaming
- HIV and AIDS
- Drug and substance abuse
- Professional growth and development
- Technology in the workplace
- Innovation
- Emerging issues

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> 1.1 Conducted self-management 1.2 Demonstrated interpersonal communication 1.3 Demonstrated critical safe work habits 1.4 Demonstrated the ability to lead a workplace team 1.5 Planned and organized work
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	<p>1.6 Maintained professional growth and development</p> <p>1.7 Demonstrated workplace learning</p> <p>1.8 Demonstrated problem solving skills</p> <p>1.9 Demonstrated the ability to manage performance ethically</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Access to relevant workplace where assessment can take place</p> <p>2.2 Appropriately simulated environment where assessment can take place</p>
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral questioning</p> <p>3.3 Written test</p> <p>3.4 Portfolio of Evidence</p> <p>3.5 Interview</p> <p>3.6 Third party report</p>
4. Context of Assessment	<p>Competency may be assessed</p> <p>4.1 On-the-job</p> <p>4.2 Off-the –job</p> <p>4.3 During Industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE ENVIRONMENTAL LITERACY

UNIT CODE: AQ/OS/AT/BC/06/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to demonstrate environmental literacy. It involves, controlling environmental hazard and environmental pollution, demonstrating sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs, monitoring activities on environmental protection/Programs , analyzing resource use and developing resource conservation plans

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Control environmental hazard	1.1 Storage methods for environmentally hazardous materials are strictly followed according to environmental regulations and OSHS. 1.2 Disposal methods of hazardous wastes are followed according to environmental regulations and OSHS. 1.3 <i>PPE</i> is used according to OSHS.
2. Control environmental Pollution	2.1 Environmental pollution <i>control measures</i> are implemented in accordance with international protocols. 2.2 Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999 2.3 Methods for minimizing noise pollution is complied with based on <i>Noise</i> and Excessive

	Vibration <i>Pollution and Control Regulations</i> , 2009
3. Demonstrate sustainable resource use	<p>3.1 Methods for minimizing wastage are complied with based on organizational waste management guide</p> <p>3.2 Waste management procedures are employed following principles of 3Rs (Reduce, Reuse, Recycle)</p> <p>3.3 Methods for economizing and reducing resource consumption are practiced as per the Constitution of Kenya 2010 Article 69 .</p>
4. Evaluate current practices in relation to resource usage	<p>4.1 Information on resource efficiency systems and procedures are collected and provided as per work groups/sector</p> <p>4.2 Current resource usage is measured and recorded as per work group</p> <p>4.3 Current purchasing strategies are analyzed and recorded according to industry procedures.</p> <p>4.4 Current work processes to access information and data is analyzed following enterprise protocol.</p>
5. Identify environmental legislations/conventions for environmental concerns	<p>5.1 Environmental legislations/conventions and local ordinances are identified according to the different environmental aspects/impact</p> <p>5.2 Industrial standard/environmental practices are described according to the different environmental concerns</p>
6. Implement specific environmental programs	<p>6.1 Programs/Activities are identified according to organizations policies and guidelines.</p> <p>6.2 Individual roles/responsibilities are determined and performed based on the activities identified.</p> <p>6.3 Problems/constraints encountered are resolved in accordance with organizations' policies and guidelines</p> <p>6.4 Stakeholders are consulted based on company guidelines</p>

<p>7. Monitor activities on Environmental protection/Programs</p>	<p>7.1 Activities are periodically monitored and Evaluated according to the objectives of the environmental program</p> <p>7.2 Feedback from stakeholders are gathered and considered in Proposing enhancements to the program based on consultations</p> <p>7.3 Data gathered are analyzed based on Evaluation requirements</p> <p>7.4 Recommendations are submitted based on the findings</p> <p>7.5 Management support systems are set/established to sustain and enhance the program</p> <p>7.6 Environmental incidents are monitored and reported to concerned/proper authorities</p>
<p>8. Analyze resource use</p>	<p>8.1. All resource consuming processes are Identified as per the organizational work plan</p> <p>8.2. Quantity and nature of resource consumed is determined based on processes</p> <p>8.3. Resource flow is analyzed as per different parts of the process.</p> <p>8.4. Wastes are classified according to NEMA regulations on waster management .</p>
<p>9. Develop resource Conservation plans</p>	<p>9.1. Efficiency of use/conversion of resources is determined according to industry protocol.</p> <p>9.2. Causes of low efficiency of use of resources are Determined based on industry protocol.</p> <p>9.3. Plans for increasing the efficiency of resource use are developed based on findings.</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. PPE may include but not limited to	<ul style="list-style-type: none">• Mask• Gloves• Goggles• Safety hat• Overall• Hearing protector
2. Control measures may include but not limited to	<ul style="list-style-type: none">• Methods for minimizing or stopping spread and ingestion of airborne particles• Methods for minimizing or stopping spread and ingestion of gases and fumes• Methods for minimizing or stopping spread and ingestion of liquid wastes

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Measuring
- Recording
- Analytical
- Monitoring
- Communication
- Writing

Required Knowledge

The individual needs to demonstrate knowledge of:

- PPEs
- Environmental regulations
- OSHS
- Pollution
- Waste management
- Principle of 3Rs
- Types of resources
- Techniques in measuring current usage of resources
- Environmental hazards
- Regulatory requirements

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Controlled environmental hazard 1.2 Controlled environmental pollution 1.3 Demonstrated sustainable resource use 1.4 Evaluated current practices in relation to resource usage 1.5 Demonstrated knowledge of environmental legislations and local ordinances according to the different environmental issues /concerns. 1.6 Described industrial standard environmental practices according to the different environmental issues/concerns. 1.7 Resolved problems/ constraints encountered based on management standard procedures 1.8 Implemented and monitored environmental practices on a periodic basis as per company guidelines 1.9 Recommended solutions for the improvement of the program 1.10 Monitored and reported to proper authorities any environmental incidents
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2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace with storage facilities 2.2 Tools, materials and equipment relevant to the tasks (e.g. Cleaning tools, cleaning materials, trash bags) 2.3 PPE, manuals and references 2.4 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 2.5 Case studies/scenarios relating to environmental Protection
3 Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4 Context of Assessment	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5 Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: AQ/OS/AT/BC/07/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to demonstrate occupational health and safety practices. It involves identifying workplace hazards and risks, identifying and implementing appropriate control measures to hazards and risks and implementing OSH programs, procedures and policies/guidelines.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Identify workplace hazards and risk	1.1 <i>Hazards</i> in the workplace are identified <i>based their indicators</i> 1.2 Risks and hazards are evaluated based on legal requirements. 1.3 <i>OSH concerns</i> raised by workers are addressed as per legal requirements.
2. Control OSH hazards	2.1 Hazard prevention <i>and control measures</i> are implemented as per legal requirement. 2.2 Risk assessment is conducted and a risk matrix developed based on likely impact. 2.3 <i>Contingency measures</i> , including <i>emergency procedures</i> during workplace <i>incidents and emergencies</i> are recognized and established in accordance with organization procedures.
3. Implement OSH programs	3.1 Company OSH program are identified, evaluated and reviewed based on legal requirements. 3.2 Company OSH programs are implemented as per legal requirements. 3.3 Workers are capacity built on OSH standards and procedures as per legal requirements

	3.4 <i>OSH-related records</i> are maintained as per legal requirements.
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RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical hazards – impact, illumination, pressure, noise, • vibration, extreme temperature, radiation • Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects • Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors • Ergonomics • Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, • varying metabolic cycles • Physiological factors – monotony, personal relationship, work out cycle • Safety hazards (unsafe workplace condition) – confined space, excavations, falling objects, gas leaks, electrical, poor storage of materials and waste, spillage, waste and debris • Unsafe workers’ act (Smoking in off-limited areas, Substance and alcohol abuse at work)
2. Indicators may include but not limited to:	<ul style="list-style-type: none"> • Increased of incidents of accidents, injuries • Increased occurrence of sickness or health complaints/ symptoms • Common complaints of workers related to OSH • High absenteeism for work-related reasons

<p>3. OSH concerns may include but not limited to:</p>	<ul style="list-style-type: none"> • Workers' experience/observance on presence of work hazards • Unsafe/unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks) • Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/guidelines
<p>4. Safety gears /PPE (Personal Protective Equipment) may include but not limited to:</p>	<ul style="list-style-type: none"> • Arm/Hand guard, gloves • Eye protection (goggles, shield) • Hearing protection (ear muffs, ear plugs) • Hair Net/cap/bonnet • Hard hat • Face protection (mask, shield) • Apron/Gown/coverall/jump suit • Anti-static suits • High-visibility reflective vest
<p>5. Appropriate risk controls may include but not limited to:</p>	<ul style="list-style-type: none"> • Appropriate risk controls in order of impact are as follows: • Eliminate the hazard altogether (i.e., get rid of the dangerous machine) • Isolate the hazard from anyone who could be harmed (i.e., keep the machine in a closed room and operate it remotely; barricade an unsafe area off) • Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) • Use administrative controls to reduce the risk (i.e., train workers how to use equipment safely; train workers about the risks of harassment; issue signage) • Use engineering controls to reduce the risk (i.e., attach guards to the machine to protect users) • Use personal protective equipment (i.e., wear gloves and goggles when using the machine)

6. Contingency measures may include but not limited to:	<ul style="list-style-type: none"> • Evacuation • Isolation • Decontamination • (Calling designed) emergency personnel
7. Incidents and emergencies may include but not limited to:	<ul style="list-style-type: none"> • Chemical spills • Equipment/vehicle accidents • Explosion • Fire • Gas leak • Injury to personnel • Structural collapse • Toxic and/or flammable vapors emission.
8. OSH-related Records may include but not limited to:	<ul style="list-style-type: none"> • Medical/Health records • Incident/accident reports • Sickness notifications/sick leave application • OSH-related trainings obtained

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Communication
- Interpersonal
- Presentation
- Risk assessment
- Evaluation
- Critical thinking
- Problem solving
- Negotiation

Required Knowledge

The individual needs to demonstrate knowledge of:

- General OSH Principles
- Occupational hazards/risks recognition

- OSH organizations providing services on OSH evaluation and/or work environment measurements (WEM)
- National OSH regulations; company OSH policies and protocols
- Systematic gathering of OSH issues and concerns
- General OSH principles
- National OSH regulations
- Company OSH and recording protocols, procedures and policies/guidelines
- Training and/or counseling methodologies and strategies

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified hazards in the workplace based their indicators 1.2 Evaluated workplace hazards based on legal requirements. 1.3 Addressed OSH concerns raised by workers as per legal requirements. 1.4 Implemented hazard prevention and control measures as per legal requirement. 1.5 Conducted risk assessment as per legal requirement. 1.6 Developed risk matrix based on likely impact. 1.7 Recognized and established contingency measures in accordance with organization procedures. 1.8 Identified, evaluated and reviewed company OSH program based on legal requirements. 1.9 Implemented company OSH programs as per legal requirements. 1.10 Capacity built workers on OSH standards and procedures as per legal requirements 1.11 Maintained OSH-related records as per legal requirements.
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.3 Access to relevant workplace where assessment can take place 2.4 Appropriately simulated environment where assessment can take place

3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4. Context of Assessment	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

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CORE UNITS OF COMPETENCY

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SET UP FISH FARM

UNIT CODE: AQ/OS/AT/CR/01/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to set up a fish farm. It involves conducting farm site food safety risk assessment, developing farm site food safety risk management plan, designing fish farm layout, constructing fishponds and ancillary farm structures, test running the pond, setting up integrated fish culture facilities, monitoring and evaluating farm set up, and exiting fish farm site.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct Farm site Food safety risk assessment	1.1. Farm site and adjacent site <i>hazards</i> are identified and documented. 1.2. Possible <i>sources</i> of physical, chemical and microbial hazards are identified based on <i>prior use of land</i> . 1.3. Level of risk is assessed and established as per fish codes of practice
2. Develop farm site food safety risk management plan	2.1 <i>Preventive measures</i> for farm site hazards are established as per identified source of contamination and manual of standard operating procedures 2.2 Standard operating procedures for preventing and correcting farm site risks are developed based on the identified risks. 2.3 Farm site food safety status is evaluated based on statutory requirements and standards 2.4 Risk is communicated as per policies for internal and external communication 2.5 Approval and certification of farm site is sought from relevant certification bodies based on <i>statutory requirements and standards</i>
3. Design fish farm layout	3.1 Fish farming site is selected based on quality and quantity of water, soil type, topography and the level of identified risks. 3.2 Fish farm layout is designed as per manual of standard operating procedures and standards and statutory requirements. 3.3 <i>Fish culture units</i> and <i>ancillary farm structures</i> are designed in accordance with intended use, size and soil type. 3.4 Construction costs are worked out based on client's budget.

	<p>3.5 Tools, equipment, materials and supplies are identified and gathered based on job requirements.</p> <p>3.6 Statutory requirements are met and necessary permits acquired from relevant authorities.</p> <p>3.7 PPEs are identified and gathered as per job requirements</p>
4. Construct fish ponds and ancillary farm structures	<p>4.1 Occupational safety and food safety precautions are applied according to site requirements and food safety management plan.</p> <p>4.2 Fish pond site is cleared based on vegetation on the site and nature of topsoil.</p> <p>4.3 Fish pond area is measured and pegged based on design dimensions.</p> <p>4.4 A perimeter core trench is constructed around the pond area based on soil characteristics.</p> <p>4.5 Fish pond area is excavated based on design dimensions.</p> <p>4.6 Dykes are constructed and aligned to the design specification.</p> <p>4.7 Supply and drainage channel are constructed based on design and topography.</p> <p>4.8 Inlets and outlets are fitted based on design specifications.</p> <p>4.9 Ancillary farm structures are constructed or installed based on the farm design specifications</p> <p>4.10 Predator control devices are installed as per best management practices</p> <p>4.11 Soil erosion control measures are taken based on good agricultural practices manual</p>
5. Test run the pond	<p>5.1 Pond is filled with water stepwise to full capacity</p> <p>5.2 Pond is checked for defects and wall stability as per standard operating procedures</p> <p>5.3 Inlets and outlets are assessed against design specifications</p> <p>5.4 Faults are reported and rectified as per standard operating procedures and the food safety management plan</p>
6. Set up integrated fish culture facilities	<p>6.1 Livestock species for integration identified based on farmer preference</p> <p>6.2 Livestock housing structures are designed according to identified species</p> <p>6.3 Livestock housing structures constructed according to species-specific designs and pond size</p>
7. Monitor and evaluate farm set up	<p>7.1 Farm is monitored and evaluated based on food safety standards and food safety management plan</p> <p>7.2 Farm is approved for conformity to statutory requirements by relevant authorities</p>
8. Exit fish farm site	<p>8.1 Recyclable materials and supplies are stored based on manufacturer's instructions.</p>

	<p>8.2 Non-recyclable materials are disposed off in regard to environmental protection regulations.</p> <p>8.3 Tools and equipment are cleaned and stored as per workplace procedures.</p> <p>8.4 Pond completion report is prepared and disseminated as per workplace procedures.</p> <p>8.5 Completed structures are handed over to the client based on agreed project plan</p>
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RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Chemical hazards <ul style="list-style-type: none"> ○ Heavy metals ○ Pesticides ○ Industrial chemicals • Physical hazards • Biological hazards <ul style="list-style-type: none"> ○ Aquatic animal diseases <p>Naturally occurring toxins</p>
2. Sources may include but not limited to:	<ul style="list-style-type: none"> • Agricultural chemicals • Toxic plants • Fecal matter • Soil • Water
3. Prior use of land may include but not limited to:	<ul style="list-style-type: none"> • For animal feeding or domestic animal production; • As a waste disposal site (garbage or toxic industrial waste); • As a sanitary waste management site; • For mining activities, oil or gas extraction; • For former agricultural activities; • Adjacent land utilization and neighbouring areas (risk of cross-contamination); • History of flooding in area of concern.

<p>4. Statutory requirements and standards may include but not limited to:</p>	<ul style="list-style-type: none"> • EIA report • Lease agreement/ title deeds • Compliance to standards and regulations <ul style="list-style-type: none"> ○ Kenya Fisheries Service ○ County Government ○ The Fisheries Management and Development Act No.35 of 2016. ○ The Codex Alimentarius Food Hygiene Basic Texts; ○ The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; ○ The Pest Control Products Act, Cap. 346 of the Laws of Kenya; ○ The Public Health Act, Cap. 242 of the Laws of Kenya; ○ The Environmental Management and Co-ordination Act, 1999.
<p>5. Preventive measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Location, design and layout of farm • Farm waste management • Pond nets • Pest control • Pond lining • Runoff control
<p>6. Fish culture units include but not limited to :</p>	<ul style="list-style-type: none"> • Earthen ponds • Lined ponds • Concrete ponds • Plastic tanks • Fibre reinforced plastic tanks
<p>7. Ancillary farm structures include but not limited to</p>	<ul style="list-style-type: none"> • Fish feed Stores • Office • Water storage tanks • Filtration facilities • Pump house • Aerators • Generator room • Staff houses
<p>8. Tools, equipment, materials and supplies include but not limited to:</p>	<ul style="list-style-type: none"> • Tools-tape measure, spirit level, jembes, spades, pangas, • Equipment-plate compactors and rollers, wheelbarrows • Materials and supplies-ropes, liners, pegs, plumbing materials, lime, cement, sand

9. Permits include but not limited to :	<ul style="list-style-type: none"> • Water abstraction permit (WARMA)
10. PPE's include but not limited to	<ul style="list-style-type: none"> • Gum boots, helmets, gloves, overalls, first aid kits
11. Soil erosion control measures include but not limited to:	<ul style="list-style-type: none"> • Planting grass on the dykes
12. Livestock include but not limited to	<ul style="list-style-type: none"> • Chicken • Ducks • Geese • Sheep • Goats • Pigs

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Training skills
- Use of tools and equipment
- Measurement
- Drawing and sketching
- Communication skills
- Basic first aid skills
- fish farm and pond designs
- Interpretation of pond designs
- Basic survey skills
- Water quality testing

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards (codes of practice for fish and fishery products)
- Regulatory bodies/ Competent authorities in the fish sector
- Hazard Analysis Critical Control Point (HACCP)
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions

- Principles of food hygiene
- National legislations and regulations
- Types of tools, equipment and PPEs
- Design and drawing
- Budgeting
- Behavior of predators and related control measures
- Water quality parameters
- Water quality test kits and digital meters
- Animal husbandry

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified a suitable site for fish farm location 1.2 Developed a food safety risk management and communication plan for the farm site 1.3 Designed fish farm layout 1.4 Designed Fish culture units and ancillary farm structures 1.5 Cleared all vegetation and top soil, and stowed away from construction area 1.6 Constructed ponds 1.7 Constructed and/ or installed ancillary farm structures 1.8 Tested components of the farm separately and collectively 1.9 Cleaned and stored tools and equipment 1.10 Identified livestock species for integration 1.11 Constructed livestock housing structures 1.12 Observed safety procedures
<p>2. Resource Implications</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Tools and equipment 2.4 Pond construction materials 2.5 Writing materials
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation

	<p>3.2 Oral questioning</p> <p>3.3 Written test</p> <p>3.4 Portfolio of Evidence</p> <p>3.5 Interview</p> <p>3.6 Third party report</p>
4. Context of Assessment	<p>Competency may be assessed:</p> <p>4.1 On-the-job</p> <p>4.2 Off-the –job</p> <p>4.3 During Industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

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PRODUCE FISH FEEDS

UNIT CODE: AQ/OS/AT/CR/02/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to produce fish feeds. It involves conducting fish feed food safety risk assessment, developing fish feed food safety risk management plan, producing natural fish feeds, producing on-farm formulated fish feeds and monitoring and evaluating fish feed performance.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct fish feed production food safety risk assessment	1.1 Hazards at each fish feed production stage are identified and documented. 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination are identified as per the hazards 1.3 Level of risk is assessed and established as per Kenya fish feed standards
2. Develop fish feed production food safety risk management plan	2.1 Preventive measures are established as per identified source of contamination and manual of standard operating procedures 2.2 Corrective measures are established as per identified source of contamination and manual of standard operating procedures 2.3 Standard operating procedures for preventing and correcting fish feed safety risks are developed based on the identified risks. 2.4 Fish feed food safety status is evaluated based on <i>statutory requirements and standards</i> 2.5 Risk is communicated as per policies for internal and external communication 2.6 Approval and certification of fish feed is sought from relevant certification bodies based on statutory requirements and standards
3. Produce natural fish feeds	3.1 <i>PPE's</i> are identified and gathered as per task requirements 3.2 <i>Materials and equipment for producing natural fish foods</i> are identified and gathered based on task requirements while observing food safety

	<p>3.3 Pond is cleaned, limed, dried and flooded with water fit for aquaculture as per standard operating procedures</p> <p>3.4 Natural productivity of pond is determined based on secchi depth</p> <p>3.5 Fish pond is fertilized based on pond's natural productivity and recommended rates of fertilization</p>
4. Produce on-farm formulated fish feeds	<p>4.1 On-farm feed production materials and equipment are identified and gathered based on quality, food safety status, cost and availability</p> <p>4.2 Feed ingredient samples are collected and subjected to proximate analysis</p> <p>4.3 Feed premixes are identified and procured while observing Kenya fish feed standards</p> <p>4.4 Feed composition is formulated using Pearson's Square Method or computer software, based on available ingredients and nutrient requirements of target species</p> <p>4.5 Feed ingredients are subjected to appropriate treatments to inactivate anti-nutritional factors</p> <p>4.6 Feed ingredients are milled to fine particles of uniform size while observing food hygiene standards</p> <p>4.7 Feed additives where required are added as per standard and statutory requirements</p> <p>4.8 Formulated feed proportions are weighed and mixed uniformly</p> <p>4.9 Feed mixture is pelletized and/or dried to a moisture content of 10% or less</p> <p>4.10 Fish feed is weighed and packaged in sealed bags with clear label details</p> <p>4.11 Dry fish feeds are stored in cool and dry areas</p> <p>4.12 Moist fish feeds are properly refrigerated as per the identified food safety risks</p> <p>4.13 Fish feed is stored as per recommended storage conditions</p>
5. Monitor and evaluate fish feed performance	<p>5.1 Samples of produced feed are subjected to analysis to ascertain nutritional content and food safety status.</p> <p>5.2 Feeds are tested for suitability based on physical parameters, palatability and feed conversion ratio</p> <p>5.3 Produced feed is fed to target fish at recommended rates</p> <p>5.4 Fish growth rate is monitored according to sampling plan</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Sources may include but not limited to:	<ul style="list-style-type: none"> • Chemical <ul style="list-style-type: none"> ○ Heavy metals ○ Ingredients used for formulation of feeds ○ Agricultural chemicals • Physical • Microbial • Poor storage conditions • Pests • Rodents
2. Statutory requirements and standards may include but not limited to:	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
3. PPE's may include but not limited to	<ul style="list-style-type: none"> • Safety goggles, gum boots, helmets, gloves, dust coats, first aid kits, mouth piece
4. Materials and equipment for producing natural fish foods may include but not limited to:	<ul style="list-style-type: none"> • Fertilizers, secchi disk, weighing scale • Buckets, gunny bags, sticks, stakes, sample containers • Personal computers
5. Natural productivity include but not limited to:	<ul style="list-style-type: none"> • Phytoplanktons • Zooplanktons

6. On-farm feed production materials and equipment may include but not limited to:	<ul style="list-style-type: none"> • Meat mincer, blender/ grinder, weighing scale, dryer, mixer, containers, bag sealer, oven, burner, drying racks • Packaging bags, drying canvas/ polythene •
7. Feed ingredients may include but not limited to:	<ul style="list-style-type: none"> • Plant protein • Animal protein • Cereals and by-products • Mineral and other additives
8. Feed premixes may include but not limited to:	<ul style="list-style-type: none"> • Vitamin, mineral, lysine and methionine
9. Nutrient requirements may include but not limited to:	<ul style="list-style-type: none"> • Proteins, • Lipids/fats • Ash • Carbohydrates • Moisture • Mineral and vitamin
10. Treatments may include but not limited to:	<ul style="list-style-type: none"> • Roasting • Boiling • Fermentation • Sun-drying
11. Label details may include but not limited to:	<ul style="list-style-type: none"> • Date of manufacture, name of manufacturer, date of expiry, storage conditions, protein level, pellet size, target species.
12. Storage conditions may include but not limited to:	<ul style="list-style-type: none"> • Humidity, temperature, ventilation, FIFO
13. Physical parameters may include but not limited to:	<ul style="list-style-type: none"> • floatability • bulk density • water stability • feed fines/ dust • size • shape • Texture
14. Sampling plan may include but not limited to:	<ul style="list-style-type: none"> • Sampling frequency • Sample size • Sampling time

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Training skills
- Use of tools and equipment
- Measurement
- Mixing ingredients
- Communication
- Basic first aid
- Numeracy
- ICT
- Record keeping

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- National legislations and regulations in fish sector
- Types of tools, equipment and PPEs
- Budgeting
- On-farm fish feed formulation
- Locally available raw materials
- Nutritional composition of the raw materials and their properties
- Fish nutrition

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Developed fish feed food safety risk management plan 1.2 Determined natural productivity of the fish pond 1.3 Identified and calculated quantities and types of fertilizers to be used 1.4 Formulated feed composition correctly as per target species
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	<ul style="list-style-type: none"> 1.5 Applied the correct fertilizer at right amounts using appropriate method 1.6 Applied the right treatment to inactivate anti-nutritional factors in selected feed ingredients 1.7 Weighed accurate amounts of feed ingredients based on feed formulation 1.8 Mixed feed ingredients uniformly 1.9 Tested feed for bulk density, water stability and floatability 1.10 Stored produced feed under recommended storage conditions 1.11 Feed composition is formulated using Pearson's Square Method or computer software, based on available ingredients and nutrient requirements of target species 1.12 Subjected feed ingredients and finished feed to proximate analysis 1.13 Maintained proper records on fish response to the feed produced
2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Materials and equipment 2.4 Feed ingredients 2.5 Writing materials
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Projects 3.4 Written tests 3.5 Portfolio of Evidence 3.6 Interview 3.7 Third party report
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

MANAGE FISH HATCHERY

UNIT CODE: AQ/OS/AT/CR/03/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to manage fish hatchery. It involves conducting fish hatchery food safety risk assessment, developing fish hatchery food safety risk management plan, preparing hatchery to receive new stock, managing broodstock, producing fingerlings, maintaining hatchery facility, and monitoring and evaluating implementation of fish hatchery food safety management plan

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct fish hatchery food safety risk Assessment	1.1 Food safety <i>Hazards</i> in the fish hatchery are identified and documented 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination in the hatchery are identified based on the hazards 1.3 Level of risk is assessed and established as per fish codes of practice and standards
2. Develop fish hatchery Food Safety Risk Management Plan	2.1 <i>Preventive measures</i> for fish hatchery hazards are established as per identified source of contamination and manual of standard operating procedures 2.2 <i>Corrective measures</i> for fish hatchery hazards are established as per identified source of contamination and manual of standard operating procedures 2.3 Standard operating procedures for preventing and correcting fish hatchery food safety risks are developed based on the identified risks. 2.4 Fish hatchery food safety status is evaluated based on statutory requirements and standards 2.5 Risk is communicated as per policies for internal and external communication 2.6 Approval and certification of fish hatchery food safety status is sought from relevant certification bodies based on <i>statutory requirements</i> and <i>food safety standards</i>
3. Prepare hatchery to	1.1 PPE's are identified and gathered as per task requirements

receive new stock	<p>1.2 Tools, equipment and materials are assembled as per task requirements</p> <p>1.3 Ponds are drained to dryness, limed and filled with water as per standard operating procedures.</p> <p>1.4 Happa nets are washed, disinfected, dried and set in the ponds</p> <p>1.5 Tanks are cleaned, disinfected and filled with water as per standard operating procedures</p>
4. Manage broodstock	<p>4.1 Broodstock is identified and sourced from either government authenticated hatcheries or the wild based on desirable features for initial stocking</p> <p>4.2 Broodstock is acclimatized based on culture unit temperatures</p> <p>4.3 Broodstock is quarantined based on information on possible infections from the source</p> <p>4.4 Broodstock is sorted and stocked into broodstock ponds based on maturity stage and stocking density specific to the species</p> <p>4.5 Selection of ripe breeders is carried out from existing broodstock based on <i>state of readiness</i> as determined by physical appearance</p> <p>4.6 Brood stock is fed at maintenance ratio</p> <p>4.7 Water quality parameters are monitored at regular intervals and corrective action taken as per manual of standard operating procedures</p> <p>4.8 Broodstock are monitored for signs of infections and stress</p> <p>4.9 Old broodstock are continuously replaced based on age and productivity</p>
5. Produce fingerlings	<p>5.1 Breeding facilities are cleaned and filled with water as per standard operating procedures</p> <p>5.2 Selection of ripe breeders is carried out from existing broodstock based on readiness as determined by physical appearance and number of fingerlings required</p> <p>5.3 Selected breeders for natural breeding are transferred to breeding facilities based on species specific stocking density</p> <p>5.4 Selected breeders for artificial propagation are treated with hormones to induce breeding as per manual of standard operating procedures</p> <p>5.5 Stripping, fertilization and incubation of eggs is carried out using standard procedures</p> <p>5.6 Live feeds are cultured based on standard procedures</p> <p>5.7 Hatchlings are nursed based on optimum water quality parameter ranges and nutritional requirements</p> <p>5.8 Hormone treated feed is prepared as per recommended</p>

	<p>mixing ratios of hormone to feed</p> <p>5.9 Tilapia hatchlings are sex reversed to males using hormone treated feed as per manual of standard operating procedures</p> <p>5.10 Fish fry are graded regularly by size based on growth rates and stocking density</p> <p>5.11 Fingerlings are harvested and packaged based on distance from the hatchery</p>
6. Maintain hatchery facility	<p>6.1 Functionality of plumbing works assessed in terms of water flow rates and absence of leakages</p> <p>6.2 Cleaning schedule developed and implemented for the hatchery</p> <p>6.3 Water quality parameter ranges are maintained within optimum levels</p> <p>6.4 Repairs on hatchery facilities are carried out based on identified faults</p>
7. Monitor and evaluate implementation of fish hatchery food safety management plan	<p>7.1 Level of hazards in the fish hatchery is monitored regularly to ensure they are within control as per manual of standard operating procedures</p> <p>7.2 Approval and certification of fish hatchery is maintained as per relevant certification bodies based on statutory requirements and standards</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical • Chemical <ul style="list-style-type: none"> ○ Heavy metals ○ Pesticide residues • Microbial <ul style="list-style-type: none"> ○ Parasites ○ Viruses ○ Bacteria ○ Hormones • Fish tags

<p>2. Sources of contamination may include but not limited to:</p>	<ul style="list-style-type: none"> • Infected parent stock/ broodstock • Poor water quality • Human carriers • Cleaning agents • Pesticides • Antibiotics misuse
<p>3. Preventive measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Quarantine of brooders • Good water quality • Sanitary and phytosanitary measures • Biosecurity measures
<p>4. Corrective measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Parasite control • Fish treatment • Water quality management • Sterilization of the hatchery
<p>5. Statutory requirements may include but not limited to:</p>	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
<p>6. Food safety standards may include but not limited to:</p>	<ul style="list-style-type: none"> • Codes of practice • Principles of food hygiene • Recommended guidelines • Specifications for maximum limits for hazards
<p>7. PPE's may include but not limited to:</p>	<ul style="list-style-type: none"> • Safety goggles, gum boots, wading suit, gloves, dust coats, first aid kits, life ring, life jacket
<p>8. Tools and equipment may include but not limited to:</p>	<ul style="list-style-type: none"> • Dissecting kit, weighing balance, pair of pincers, pestle and mortar, needle and syringe, measuring cylinders, , hatching jars, larval rearing trays, perforators, basins, harvesting gear, happa nets, buckets, scoop nets, water test kits, refrigerator, air pump and stone diffusers, plankton nets, light bulb, submersible heater, thermometer, fluorescent light

9. Materials may include but not limited to:	<ul style="list-style-type: none"> • Salt, towel, egg substrates, warm water, anaesthesia, 17-α Methyl Testosterone, feeds, fertilizers, ethanol, acetone, vials, cotton wool, assorted bowls, hypochlorite solution
10. State of readiness may include but not limited to:	<ul style="list-style-type: none"> • Ready to spawn (swollen abdomen), not yet ready, already spawned
11. Water quality parameters may include but not limited to:	<ul style="list-style-type: none"> • Dissolved oxygen • Temperature • pH • ammonia • nitrite • alkalinity • turbidity
12. Breeding facilities may include but not limited to	<ul style="list-style-type: none"> • Earthen ponds, happa nets, concrete tanks, plastic tanks,
13. Hormones may include but not limited to:	<ul style="list-style-type: none"> • Pituitary extract, synthetic hormones
14. Live feeds may include but not limited to	<ul style="list-style-type: none"> • Artemia • Copepods • Rotifers • Algae
15. Cleaning schedule may include but not limited to:	<ul style="list-style-type: none"> • Types of cleaning and disinfection agents • Procedure followed in cleaning • Frequency of cleaning • Personnel involved
16. Repairs may include but not limited to:	<ul style="list-style-type: none"> • Fixing leakages in ponds, pipes, tanks • Fixing damaged happa and harvesting nets

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Training skills
- Use of tools and equipment
- Weighing

- Numeracy
- Fish handling and packaging
- Dissection
- Identification of anatomical features
- Stripping and injection
- Basic first aid
- Hand sexing of brooders
- Identification of signs of healthy fish
- Testing water quality
- Preparation of hormone treated feed

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety standards
- Hazard Analysis Critical Control Points (HACCP)
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- Types of tools, equipment and PPEs
- Use of water test kits and equipment
- Fish breeding
- Basic fish anatomy and physiology
- Fish diseases
- Water quality parameters
- Fish feeds and feeding
- Fish hatchery biosecurity

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Developed fish hatchery Food Safety Risk Management Plan 1.2 Prepared fish culture facilities for stocking broodstock 1.3 Sourced broodstock with desirable features 1.4 Monitored water physico-chemical parameters using appropriate equipment
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	<ul style="list-style-type: none"> 1.5 Quarantined incoming broodstock in specially designated ponds 1.6 Acclimatized the incoming fish upon arrival on the farm 1.7 Selected ripe breeders for breeding exercise accurately 1.8 Identified and extracted pituitary gland from the donor fish 1.9 Stripped brood fish of maximum possible amount of eggs or milt without spilling or dropping the fish 1.10 Cultured live feeds 1.11 Prepared hormone treated feed as per recommended mixing ratios 1.12 Harvested and graded fry to uniform sizes
2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Materials, tools, and equipment 2.4 Broodstock
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Projects 3.4 Written tests 3.5 Portfolio of Evidence 3.6 Interview 3.7 Third party report
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

PRODUCE GROW-OUT FISH

UNIT CODE: AQ/OS/AT/CR/04/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to produce grow out fish. It involves conducting fish grow-out food safety risk assessment, developing fish grow-out food safety risk management plan, developing fish stocking and harvesting program, preparing grow-out culture units, stocking grow-out culture units, managing fish feeding, managing fish stock health, controlling weeds, predators and intrusive animals, harvesting fish stock, maintaining grow-out culture units, integrating fish farming with livestock and poultry and monitoring and evaluating effectiveness of food safety management system of the fish grow-out.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct Fish Grow-out Food safety Risk Assessment	1.1 Food safety <i>Hazards</i> in the fish grow-out are identified and documented. 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination in the fish grow-out are identified based on the <i>hazards</i> 1.3 Level of risk in the fish grow-out is assessed and established as per manual of standard operating procedures.
2. Develop Fish Grow-out Food Safety Risk Management Plan	2.1 <i>Preventive measures</i> for fish grow-out hazards are established as per identified source of contamination and manual of standard operating procedures. 2.2 <i>Corrective measures</i> for fish grow-out hazards are established as per identified source of contamination and manual of standard operating procedures. 2.3 Standard operating procedures for correcting and preventing fish grow-out safety risks are developed based on the identified risks. 2.4 Fish grow-out food safety status is evaluated based on statutory requirements and standards 2.5 Risk is communicated as per policies for internal and external communication

	2.6 Approval and certification of fish grow-out food safety status is sought from relevant certification bodies based on <i>statutory requirements and standards</i>
3. Develop fish stocking and harvesting program	<p>3.1 Stocking plan is prepared as per the capacity of the culture units to be stocked</p> <p>3.2 Sources of quality fingerlings identified from government certified hatcheries</p> <p>3.3 Number of required fingerlings is calculated based on number of ponds and stocking densities</p> <p>3.4 Stocking order of ponds is determined based on projected market trends</p> <p>3.5 Harvest schedule of ponds determined based on stocking date and prevailing market demand</p>
4. Prepare grow-out culture units	<p>4.1 PPEs are identified and gathered as per task requirement</p> <p>4.2 Safety precautions are adhered to in line with OSHA</p> <p>4.3 Tools, equipment and materials are assembled in line with task requirement</p> <p>4.4 Grow-out culture unit is drained to dryness</p> <p>4.5 Grow-out culture unit is cleaned, and repairs carried out based on identified faults</p> <p>4.6 Ponds are limed as per the measured pH levels and soil texture</p> <p>4.7 Indoor culture units are disinfected using permitted disinfectants as per aquaculture code of practice</p> <p>4.8 Grow-out culture unit is filled with water fit for aquaculture to required depth.</p> <p>4.9 Grow-out culture unit is fertilized uniformly as per the recommended fertilization rates</p>
5. Stock grow-out culture units	<p>5.1 Fingerlings are sourced from government authenticated hatcheries</p> <p>5.2 Fingerlings are transported to the farm under controlled temperatures and aeration.</p> <p>5.3 Fingerlings are acclimatized based on culture unit temperatures</p> <p>5.4 Fingerlings are gently released in to culture units as per the stocking plan</p> <p>5.5 Stocked ponds are monitored for fingerling stress and mortalities through direct observations</p>
6. Manage fish feeding	<p>6.1 Fish feeding schedule is developed based on the cultured fish species and weight.</p> <p>6.2 Fish are fed as per the feeding schedule using appropriate method</p> <p>6.3 Fish feeding is monitored and appropriate actions taken based on prevailing weather conditions and fish behavior</p>

	<p>6.4 Feeding ration adjustments are calculated based on results from periodic fish sampling and weight measurements</p> <p>6.5 Feeds are handled and stored according to manual of standard operating procedures and manufacturer's instructions.</p> <p>6.6 Feed and feeding records are maintained according to work place requirements</p> <p>6.7 Fertilization of the culture units is carried out in accordance with secchi depth measurements</p> <p>6.8 Water quality parameters are monitored and remedial measures undertaken in accordance with target species optimum ranges</p>
7. Manage fish stock health	<p>7.1 Fish are checked for signs of stress and disease based on physical appearance and behavioral changes</p> <p>7.2 Remedial measures for stressed and diseased fish are undertaken as per Food and Agriculture Organization (FAO) Technical Guidelines for Responsible Fisheries- Aquaculture</p> <p>7.3 Water quality parameters are monitored and remedial measures undertaken in accordance with target species optimum ranges</p> <p>7.4 Biosecurity measures are put in place to prevent disease outbreaks</p>
8. Control weeds, predators and intrusive animals	<p>8.1 <i>Fish predators and intrusive animals</i> are identified</p> <p>8.2 <i>Pond weeds</i> are identified and removed while observing good aquaculture practices</p> <p>8.3 <i>Control measures</i> for predators and intrusive animals are put in place</p>
9. Harvest fish stock	<p>9.1 <i>Harvesting plan</i> is prepared as per the identified market demand</p> <p>9.2 <i>Harvesting tools, equipment and food grade materials</i> are assembled in line with task requirement</p> <p>9.3 Harvesting of fish is carried out using appropriate nets and techniques while observing good hygienic practices for fish handling.</p> <p>9.4 Harvested fish is sorted according to size and species while observing good hygienic practices for fish handling.</p>
10. Maintain grow-out culture units	<p>10.1 <i>Maintenance tools, equipment and materials</i> are assembled as per the task requirements</p> <p>10.2 Grass on pond dykes is cleared periodically to ground level</p> <p>10.3 Surrounding vegetation is cleared as per best farm management practices</p>

	<p>10.4 Pipes and drainage blockages are cleared to allow free flow of water</p> <p>10.5 Damaged components are identified and repaired</p>
11. Integrate fish farming with livestock and poultry	<p>11.1 Selected livestock moved into the housing structures at recommended densities</p> <p>11.2 Livestock raised according to best management practices</p> <p>11.3 Fish and livestock rearing activities are coordinated according to farm planning</p>
12. Monitor and evaluate effectiveness of food safety management system of the fish grow-out	<p>12.1 Performance of hazard control measures put in place are monitored regularly to ensure they are within control as per HACCP plan.</p> <p>12.2 Approval and certification of fish grow-out is maintained as per relevant statutory requirements and standards</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical • Chemical <ul style="list-style-type: none"> ○ Heavy metals • Microbial <ul style="list-style-type: none"> ○ Sick fish ○ Antibiotic residues ○ Bio-accumulation ○ Parasites ○ Viruses ○ Bacteria

<p>2. Sources of hazards may include but not limited to:</p>	<ul style="list-style-type: none"> • Poor feeding • Poor feed quality • Poor water quality • Human carriers • Cleaning agents • Pesticides • Industrial/ agricultural wastes
<p>3. Preventive measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Good water quality • Sanitary measures • Proper use of antibiotics • Disease management • Parasite control • Use of quality feed • Good hygienic practices • Biosecurity measures • Probiotics
<p>4. Corrective measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Disposal of contaminated fish • Fish treatment • Water flow management • Sterilization of the fish grow-out
<p>5. Statutory requirements and standards may include but not limited to:</p>	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
<p>6. Stocking plan may include but not limited to:</p>	<ul style="list-style-type: none"> • Species of fish, stocking density, source of fingerlings, stocking schedule
<p>7. PPEs include may include but not limited to</p>	<ul style="list-style-type: none"> • Safety goggles, gum boots, helmets, gloves, dust coats, first aid kits, industrial mouth piece

<p>8. Tools, equipment and materials may include but not limited to:</p>	<ul style="list-style-type: none"> • Measuring tape • Weighing scale • Wheelbarrow • pH meter • Jembes • Spades • Rakes • Lime • Fertilizer • Tamper • Ropes • Liner repair kit
<p>9. Grow-out culture unit may include but not limited to</p>	<ul style="list-style-type: none"> • Earthen ponds • Concrete tanks • Plastic tanks • Fiberglass • Raceways
<p>10. Water fit for aquaculture may include but not limited to</p>	<ul style="list-style-type: none"> • Fish species specific recommended level of chlorine • Fish species specific Recommended pH range • Fish species specific Recommended Ammonia • Fish species specific recommended turbidity level • Free of infective pathogens
<p>11. Fish predators and intrusive animals may include but not limited to:</p>	<ul style="list-style-type: none"> • Birds, mammals, reptiles, amphibians, invertebrates, man
<p>12. Pond weeds may include but not limited to</p>	<ul style="list-style-type: none"> • Submerged vegetation • Emergent vegetation • Floating vegetation
<p>13. Control measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Clearing grass, trimming vegetation, traps and scarecrows, cover net, twines, screens, fencing
<p>14. Harvesting plan may include but not limited to:</p>	<ul style="list-style-type: none"> • Quantities to harvest • Time of harvest • Size to harvest • Culture unit to harvest • Partial or complete

15. Harvesting tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> • Seine net, scoop net, buckets, laundry baskets, weighing scale, perforators
16. Maintenance tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> • Slashers, machetes, jembes, spades, wheelbarrow, rakes, gunny bags

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Training skills
- Use of tools and equipment
- Basic plumbing
- Pond construction
- Measuring
- Fish handling
- Record keeping
- Fish feeding
- Predator control
- Fish harvesting
- Communication
- Basic first aid
- Numeracy

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards
- Hazard Analysis Critical Control Points (HACCP)
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- Types of tools, equipment and PPEs
- Fish disease
- Basic fish biology

- Fish feeds and feeding methods
- Types and characteristics of fertilizers
- Water quality parameters
- Fish predators and intrusive animals
- Aquatic weeds
- Animal husbandry

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Developed fish grow-out food safety risk management plan 1.2 Prepared stocking plan 1.3 Drained grow-out culture unit to dryness 1.4 Fertilized fish pond using the recommended rates 1.5 Calculated number of fingerlings required 1.6 Stocked ponds with minimal mortalities 1.7 Calculated accurate feed rations based on sampled weights 1.8 Maintained accurate feed and feeding records 1.9 Positively diagnosed fish for signs of stress and disease, and took remedial measures 1.10 Put in place effective measures for control of weeds, predators and intrusive animals 1.11 Harvested fish using appropriate techniques 1.12 Maintained a clean environment within and around the production area 1.13 Integrated livestock maintained at recommended densities in relation to pond sizes
<p>2. Resource Implications</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Tools, materials and equipment 2.4 Writing materials 2.5 Calculator
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Ora questioning

	<p>3.3 Projects</p> <p>3.4 Written tests</p> <p>3.5 Portfolio of Evidence</p> <p>3.6 Interview</p> <p>3.7 Third party report</p>
4. Context of Assessment	<p>Competency may be assessed:</p> <p>4. 1On-the-job</p> <p>4. 2Off-the –job</p> <p>4. 3During Industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

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HANDLE HARVESTED FISH

UNIT CODE: AQ/OS/AT/CR/05/6/B

Unit description

This unit specifies the competencies required to handle harvested fish. It involves conducting fish harvesting food safety risk assessment, developing fish harvesting food safety risk management plan, preparing harvested fish for preservation, preserving harvested fish, processing harvested fish, managing waste from fish processing, monitoring and evaluating effectiveness of food safety management system of fish handling and marketing fish, fish products and by-products.

ELEMENT	PERFORMANCE CRITERIA
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i>Bold and italicized terms are elaborated in the Range</i></p>
<p>1. Conduct fish Harvesting Food Safety Risk Assessment</p>	<p>1.1 Food safety <i>Hazards</i> in the fish handling are identified and documented.</p> <p>1.2 Possible <i>sources</i> of physical, chemical and microbial contamination in the fish handling are identified based on the hazards</p> <p>1.3 Level of risk in the fish handling is assessed and established as per manual of standard operating procedures</p>
<p>2. Develop fish harvesting Food Safety Risk Management Plan</p>	<p>2.1 <i>Preventive measures</i> for fish handling hazards are established as per identified source of contamination and manual of standard operating procedures</p> <p>2.2 <i>Corrective measures</i> for fish handling hazards are established as per identified contamination and manual of standard operating procedures</p> <p>2.3 Standard operating procedures for preventing and correcting fish handling safety risks are developed based on the identified risks.</p> <p>2.4 Harvested fish food safety status is evaluated based on statutory requirements and standards</p> <p>2.5 Risk is communicated as per policies for internal and external communication</p> <p>2.6 Approval and certification of fish handling food safety status is sought from relevant certification bodies based on <i>statutory requirements and standards</i></p>

<p>3. Prepare harvested fish for preservation</p>	<p>3.1 Harvested fish is prepared as per code of practice for the handling, processing, storage and the placing on the market of fish and fisheries products</p> <p>3.2 Tools, equipment and materials are assembled</p> <p>3.3 PPEs are identified and gathered as per task requirements</p> <p>3.4 Harvested fish is graded according to size and species as per the target market</p> <p>3.5 Fish is cleaned with potable water to remove all slime and foreign materials</p> <p>3.6 Fish is scaled as per target market requirements</p> <p>3.7 Fish is gutted to remove visceral material without rupturing</p> <p>3.8 Gutted fish is cleaned to remove blood stains and gut remains from stomach cavity</p> <p>3.9 Tools, equipment and materials used are cleaned as per standard sanitary operating procedures and stored in designated places</p>
<p>4. Preserve harvested fish</p>	<p>4.1 Fish is preserved as per code of hygiene practice for the handling, processing, storage and the placing on the market of fish and fisheries products</p> <p>4.2 Fish meant for short term preservation is kept in appropriate containers with ice in alternate layers following standard icing procedures</p> <p>4.3 Fish meant for long term preservation is smoked, sundried, salted or frozen based on market preference</p>
<p>5. Process harvested fish</p>	<p>5.1 Fish for processing is handled, stored, transported and processed according to code of hygiene practice for the handling, processing, storage and the placing on the market of fish and fisheries products</p> <p>5.2 Whole fish is filleted as per target market specifications</p> <p>5.3 Fish mince is prepared out of fish fillets or trimmings using recommended technique</p> <p>5.4 Whole fish, fish fillets or portions are deep fried to a golden-brown color</p> <p>5.5 Fish balls are prepared from fish trimmings or fish mince according to target market specification</p> <p>5.6 Fish by-products for sale are identified, collected and sorted into containers, based on market specifications</p> <p>5.7 Fish by-products for sale are processed based on their form and nature</p> <p>5.8 Packaging tools, equipment and materials are assembled in line with task requirements</p> <p>5.9 Processed fish products and by-products are packaged using material appropriate to type, size and weight of the product or by-product</p>

	<p>5.10 Packaged product or by-product is labeled according to statutory regulations and target market requirements</p> <p>5.11 Packaged products or by-products are stored in designated areas using the FIFO approach</p> <p>5.12 Storage conditions of stored fish products and by-products are monitored regularly</p>
6. Manage waste from fish processing	<p>6.1 Fish processing wastes are collected at every stage and separated according to their physical state.</p> <p>6.2 Collected wastes are handled in a manner to avoid cross contamination and harboring of pests</p> <p>6.3 Solid and liquid wastes are disposed of according to the relevant standards and legal requirements</p>
7. Monitor and evaluate effectiveness of food safety management system of fish handling	<p>7.1 Processed fish is inspected for food safety regularly as per HACCP plan.</p> <p>7.2 Approval and certification of fish processing plant is maintained as per relevant statutory requirements and standards</p>
8. Market fish, fish products and by-products	<p>8.1 Price of fish and fish products is determined based on costs of production, demand and supply and price of alternative products.</p> <p>8.2 Market outlets are identified and contacted</p> <p>8.3 Appropriate mode of transport to market is determined according to product form and quantities, and distance to market</p> <p>8.4 Fish, fish products and by-products are sold at a profit</p> <p>8.5 Product handling is carried out while observing code of hygiene practice for the handling, processing, storage and the placing on the market of fish and fisheries products</p> <p>8.6 Records of harvest and sales proceeds are maintained</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance

Variable	Range
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<p>1. Hazards may include but not limited to:</p>	<ul style="list-style-type: none"> • Pathogenic bacteria <ul style="list-style-type: none"> ○ E.g. Salmonella spp. • Chemical contaminants <ul style="list-style-type: none"> ○ e.g. Histamine • Viruses <ul style="list-style-type: none"> ○ e.g. Hepatitis • Fungi <ul style="list-style-type: none"> ○ Moulds • Foreign matter <ul style="list-style-type: none"> ○ Hair ○ Jewellery • Pests
<p>2. Sources may include but not limited to:</p>	<ul style="list-style-type: none"> • Personnel hygiene facilities and toilets • Cleaning agents • Fraud • Wash water quality • Equipment and facilities • Lubricants • Wastes
<p>3. Preventive measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Personal hygiene • Personnel health checks every 6 months • Use of food grade cleaning agents and lubricants • Pest control • Fraud control • Use of potable water • Use of food grade equipment • Proper storage conditions • Maintenance and sanitation of equipment and facilities • Temperature controls (below 4°C) • Plant hygiene • Biosecurity measures • PPEs • Waste management
<p>4. Corrective measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Disposal of contaminated fish • Sterilization of the fish handling plant

<p>5. Statutory requirements and standards may include but not limited to:</p>	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
<p>6. Tools, equipment and materials may include but not limited to:</p>	<ul style="list-style-type: none"> • Basins, buckets, hard brush, filleting tables, knives, waste disposal containers, ice box, smoking kiln, solar dryer, drying racks, drying mats or canvass, domestic freezers, ice, salt, frying oil, meat mincer, blender, crockery,
<p>7. PPEs include but not limited to</p>	<ul style="list-style-type: none"> • Gum boots, head cover, gloves, dust coats, first aid kits, mouth piece, apron
<p>8. Fish by-products may include but not limited to</p>	<ul style="list-style-type: none"> • Scales • Skins • Frames • Swim bladder
<p>9. Packaging tools, equipment and materials may include but not limited to</p>	<ul style="list-style-type: none"> • Weighing balance, polybags, cartons, gunny bags, ice packs, baskets, cool boxes, sealing tape, labels, pallets, wheelbarrow

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment
- Training skills
- Use of tools and equipment
- Weighing

- Fish handling
- Fish preservation
- Fish processing
- Packaging
- Record keeping
- Communication
- Basic first aid
- Numeracy

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards
- Hazard Analysis Critical Control Points (HACCP)
- Regulatory bodies/ Competent authorities
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- Types of tools, equipment and PPEs
- Fish spoilage
- Fish handling, processing and preservation
- Marketing and market dynamics
- Workplace safety regulations
- Waste management regulations

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Developed fish harvesting food safety risk management plan 1.2 Cleaned fish to remove all slime and foreign materials 1.3 Guted fish to remove all visceral material 1.4 Preserved fish using appropriate method 1.5 Processed fish into various products and by-products 1.6 Packaged and stored fish products in designated areas 1.7 Marketed fish products 1.8 Observed hygienic standards 1.9 Disposed of waste from fish processing
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2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Tools, materials and equipment 2.4 Writing materials 2.5 Calculator
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4. 1On-the-job 4. 2Off-the –job 4. 3During Industrial attachment
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

SET UP SMALL-SCALE FISH HATCHERY UNIT

UNIT CODE: AQ/OS/AT/CR/06/6/B

Unit description

This unit specifies the competencies required to set up fish hatchery. It involves conducting fish hatchery site food safety risk assessment, developing fish hatchery site food safety risk management plan, preparing to set up a fish hatchery unit, managing fish hatchery construction, installing fish hatchery bio-security and safety measures, and evaluating farm hatchery set up.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct fish hatchery site Food safety risk assessment	8.1 Fish hatchery site and adjacent site <i>hazards</i> are identified and documented 8.2 Possible <i>sources</i> of physical, chemical and microbial contamination are identified based on <i>prior use of land</i> . 8.3 Level of risk is assessed and established as per manual of standard operating procedures
2. Develop fish hatchery site food safety risk management plan	8.1 <i>Preventive measures</i> for fish hatchery site hazards are established as per identified source of contamination and per manual of standard operating procedures 8.2 Standard operating procedures for preventing and correcting fish hatchery site risks are developed based on the identified risks. 8.3 Fish hatchery site food safety status is evaluated based on statutory requirements and standards 8.4 Risk is communicated as per policies for internal and external communication 8.5 Approval and certification of fish hatchery is sought from relevant certification bodies based on <i>statutory requirements</i> and standards
3. Prepare to set up a fish hatchery unit	8.1 Proposed hatchery site is assessed based on <i>suitability criteria</i> for species to be cultured. 8.2 Hatchery design is prepared for specific component dimensions and relative locations based on the site survey 8.3 Hatchery shade design is prepared based on the components to be constructed and/ or installed 8.4 Proposed hatchery design is validated on site based on statutory requirements and food safety standards. 8.5 Details and cost of <i>labour</i> and materials is worked out according to prevailing prices

	8.6	Approval of the design is sought from relevant authorities
4. Manage fish hatchery construction	8.1	PPEs are identified and gathered as per task requirements
	8.2	Tools, equipment, food grade materials and supplies are identified and gathered based on task requirements.
	8.3	Site is secured and cleared of unwanted vegetation and debris
	8.4	Hatchery shade is constructed based on design specifications
	8.5	Installation of indoor hatchery facilities is carried out following design specifications
	8.6	Pegging and construction of supporting outdoor nursery and broodstock culture units is carried out as per design specifications
	8.7	Water abstraction and plumbing works are carried out according to the design
	8.8	Hatchery components are tested for functionality and identified defects are rectified
	8.9	Test run of the entire hatchery system is conducted for functionality and identified defects rectified
5. Install fish hatchery bio-security and safety measures	8.1	Footbaths are installed at hatchery entrances and other strategic points
	8.2	Hand wash and sanitizer facilities are installed at the entrances to the hatchery
	8.3	Quarantine facilities are constructed at safe distance as outlined in the hatchery designs
	8.4	Filtration systems for the incoming water is installed
	8.5	Intruder control facilities and devices are designed and installed at strategic points
	8.6	Perimeter fence is constructed around the facility
	8.7	Biosecurity facilities are tested for functionality
6. Evaluate farm hatchery set up	8.1	Farm hatchery set up is evaluated based on food safety standards
	8.2	Farm hatchery set up is approved for compliance to statutory requirements by relevant authorities

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
	<ul style="list-style-type: none"> •
<p>1. Hazards may include but not limited to:</p>	<ul style="list-style-type: none"> • Physical • Chemical <ul style="list-style-type: none"> ○ Pesticides ○ Parasites ○ Industrial chemicals ○ Naturally occurring toxins ○ Heavy metals • Microbial
<p>2. Sources of hazards may include but not limited to:</p>	<ul style="list-style-type: none"> • Agricultural chemicals • Toxic plants • Fecal matter • Soil • Water
<p>3. Prior use of land may include but not limited to:</p>	<ul style="list-style-type: none"> • For animal feeding or domestic animal production; • As a waste disposal site (garbage or toxic industrial waste); • As a sanitary waste management site; • For mining activities, oil or gas extraction; • For former agricultural activities; • Adjacent land utilization and neighbouring areas (risk of cross-contamination); • History of flooding in area of concern.
<p>4. Preventive measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Location, design and layout of farm • Farm waste management • Pond nets
<p>5. Statutory requirements may include but not limited to:</p>	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.

6. Suitability criteria may include but not limited to:	<ul style="list-style-type: none"> • Land topography • Proximity to quality and reliable water supply • Soil types • Climatic conditions • Security • Market
7. Labour may include but not limited to:	<ul style="list-style-type: none"> • Casual, skilled, consultancy,
8. PPE's may include but not limited to	<ul style="list-style-type: none"> • Gum boots, helmets, goggles, gloves, overalls, first aid kits
9. Tools, equipment, materials and supplies may include but not limited to:	<ul style="list-style-type: none"> • Tools-tape measure, spirit level, jembes, spades, pangas, plumbing tools, masonry • Equipment-plate compactors and rollers, wheelbarrows, aeration equipment, filtration • Materials and supplies-ropes, liners, pegs, plumbing materials, lime, cement, sand, roofing materials, fencing wire, timber, fittings, assorted screens, netting materials
10. Indoor hatchery facilities may include but not limited to :	<ul style="list-style-type: none"> • Tanks, sorting tables, packaging tables, plumbing works, incubation unit,
11. Plumbing works may include but not limited to :	<ul style="list-style-type: none"> • Connection piping to the hatchery block, inlet and outlet installations, drainage, storage tanks, water flow control structures
12. Hatchery components may include but not limited to:	<ul style="list-style-type: none"> • Water storage tanks, intake structure, fish culture tanks, lighting systems, aeration system, filtration system, drainage, water flow control structures, biosecurity installations
13. Intruder control facilities and devices may include but not limited to:	<ul style="list-style-type: none"> • Nets, meshes, screens, cover nets, gates

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Training skills
- Use of tools and equipment
- Measurement

- Drawing and sketching
- Communication skills
- Basic first aid skills
- Design a hatchery
- Masonry skills
- Basic plumbing
- Budgeting

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards
- Hazard Analysis Critical Control Points (HACCP)
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- National legislations and regulations
- Types of tools, equipment and PPEs
- Budgeting
- Types of nets, meshes and their properties
- Predator and intruder behavior
- Water filtration mechanisms
- Disease causing pathogens
- Pond design, layout and construction

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Developed fish hatchery site food safety risk management plan 1.2 Designed a shade and hatchery 1.3 Constructed a shade and a hatchery 1.4 Complied with all statutory requirements 1.5 Adhered to safety precautions 1.6 Installed indoor hatchery facilities 1.7 Tested hatchery component to establish functionality and rectified faults 1.8 Installed and tested biosecurity structures
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<p>2. Resource Implications</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Tools, equipment and materials 2.4 Pond construction materials 2.5 Building materials 2.6 Writing materials
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Projects 3.4 Written test 3.5 Portfolio of Evidence 3.6 Interview 3.7 Third party report
<p>4. Context of Assessment</p>	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4. 1 On-the-job 4. 2 Off-the –job 4. 3 During Industrial attachment
<p>5. Guidance information for assessment</p>	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

SET UP RECIRCULATING AQUACULTURE SYSTEM (RAS)

UNIT CODE: AQ/OS/AT/CR/07/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to set up recirculating aquaculture system. It involves conducting RAS food safety risk assessment, developing RAS food safety risk management plan, designing a small-scale Recirculating Aquaculture System (RAS), supervising construction of RAS facility, setting up bio-security measures, maintaining RAS facility, evaluating RAS set up, and exiting project site.

ELEMENT	PERFORMANCE CRITERIA
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i>Bold and italicized terms are elaborated in the Range</i></p>
<p>1. Conduct RAS Food safety risk assessment</p>	<p>1.1 Food safety <i>Hazards</i> in RAS are identified and documented.</p> <p>1.2 Possible <i>sources</i> of physical, chemical and microbial contamination in RAS are identified based on the hazards</p> <p>1.3 Level of risk in the RAS is assessed and established as per manual standard operating standards</p>
<p>2. Develop RAS food safety risk management plan</p>	<p>2.1 <i>Preventive measures</i> for RAS hazards are established as per identified source of contamination and manual standard operating standards</p> <p>2.2 <i>Corrective measures</i> for RAS hazards are established as per identified source of contamination and manual standard operating standards</p> <p>2.3 Standard operating procedures for correcting and preventing RAS risks are developed based on the identified risks.</p> <p>2.4 RAS food safety status is evaluated based on statutory requirements and standards</p> <p>2.5 Risk is communicated as per policies for internal and external communication</p> <p>2.6 Approval and certification of RAS is sought from relevant certification bodies based on <i>statutory requirements</i> and standards</p>
<p>3. Design a small-scale Recirculating Aquaculture</p>	<p>3.1 Proposed site is assessed to establish availability of basic <i>amenities</i> and infrastructure in relation to client expectations</p> <p>3.2 Size of facility is determined based on number of fish to be cultured and budget ceiling</p>

System (RAS)	<p>3.3 Components and supporting systems of the RAS system are determined based on available amenities and infrastructure</p> <p>3.4 Layout of specific components of RAS is determined in accordance with human movement and surrounding land gradient</p> <p>3.5 Mechanical and biological filter systems are designed based on water flow rates and fish stocking densities</p> <p>3.6 Waste disposal system is designed in accordance with environmental regulations and identified food safety risks</p> <p>3.7 Bills of Quantities are prepared according to system requirements and available budget</p>
4. Supervise construction of RAS facility	<p>4.1 PPEs are identified and gathered as per task requirements</p> <p>4.2 Tools, equipment, food grade materials and supplies are identified and gathered based on task requirements.</p> <p>4.3 Skilled manpower is identified and engaged based on the nature of works to be undertaken</p> <p>4.4 Site is secured and cleared of unwanted vegetation and debris</p> <p>4.5 RAS shed is constructed following design specifications</p> <p>4.6 Fixed components, ancillary units and plumbing works are set up based on facility designs</p> <p>4.7 Portable components are installed and pipe connections carried out following designed layout</p> <p>4.8 Waste disposal system is set up in compliance with environmental regulations</p> <p>4.9 Basic civil works are undertaken in accordance with design specifications</p> <p>4.10 Specific components of the RAS system are singly and collectively tested, to check for functionality</p> <p>4.11 Defects are rectified using standard procedures</p>
5. Set up bio-security measures	<p>5.1 Footbaths are installed at hatchery entrances and other strategic points</p> <p>5.2 Quarantine facilities are constructed at safe distance as outlined in the hatchery designs</p> <p>5.3 Filtration systems for the incoming water are installed</p> <p>5.4 Perimeter fence is constructed around the facility</p> <p>5.5 Intruder control facilities and devices are installed at strategic points</p> <p>5.6 Visitors, equipment and materials entering the facility are screened in accordance with farm biosecurity procedures.</p>
6. Maintain RAS facility	<p>6.1 Maintenance tools, equipment and materials are assembled as per the task requirements</p>

	<p>6.2 Water flow rate into tanks or ponds is regulated based on species cultured, stage of development and water quality</p> <p>6.3 RAS facility is cleaned and disinfected as per the standard sanitary operating procedures</p> <p>6.4 Water quality parameter ranges are maintained within optimum levels</p> <p>6.5 Maintenance and repairs of RAS components are carried out based on identified faults</p> <p>6.6 Wastes from the RAS system are disposed of according to environmental regulations and identified food safety risks</p>
7. Evaluate RAS set up	<p>7.1 Set up is evaluated based on food safety standards</p> <p>7.2 RAS set up is approved for compliance to statutory requirements by relevant authorities</p>
8. Exit project site	<p>8.3 Recyclable materials and supplies are stored based on manufacturer's instructions.</p> <p>8.4 Non-recyclable materials are disposed of in regard to environmental protection regulations.</p> <p>8.5 Tools and equipment are cleaned and stored as per workplace procedures.</p> <p>8.6 Project completion report is prepared and disseminated as per workplace procedures.</p> <p>8.7 Completed structures are handed over to the client</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical • Chemical <ul style="list-style-type: none"> ○ Accumulation of nitrogenous compounds ○ Heavy metals • Microbial <ul style="list-style-type: none"> ○ Sick fish ○ Parasites ○ Viruses ○ Bacteria
2. Sources of hazards may include but not limited to:	<ul style="list-style-type: none"> • Poor feeding • Poor feed quality • Poor water quality • Poor personnel hygiene and health • Cleaning agents

<p>3. Preventive measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Flushing process • Cleaning of sedimentation units • Good water quality • Sanitary measures • Disease management • Parasite control • Use of quality feed • Good hygienic practices • Biosecurity measures • Probiotics
<p>4. Corrective measures may include but not limited to:</p>	<ul style="list-style-type: none"> • Disposal of contaminated fish • Fish disease treatment • Water flow management • Sterilization of RAS • Control feeding process
<p>5. Statutory requirements may include but not limited to:</p>	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
<p>6. Amenities may include but not limited to:</p>	<ul style="list-style-type: none"> • Power supply • Piped water • Road network • Internet connectivity
<p>7. Components of RAS may include but not limited to</p>	<ul style="list-style-type: none"> • Fish growing tanks, Filtration system, Water circulation pump, Water heating system, Quarantine tanks, aeration and accessories, Water storage tanks, intake structure, fish culture tanks, lighting systems, aeration system, filtration system, drainage, water flow control structures, biosecurity installations

8. PPE's may include but not limited to	<ul style="list-style-type: none"> • Gum boots, helmets, goggles, gloves, overalls, first aid kits
9. Tools, equipment, materials and supplies may include but not limited to:	<ul style="list-style-type: none"> • Tools-tape measure, spirit level, jembes, spades, pangas, plumbing tools, masonry • Equipment-plate compactors and rollers, wheelbarrows, aeration equipment, filtration • Materials and supplies-ropes, liners, pegs, plumbing materials, lime, cement, sand, roofing materials, fencing wire, fittings, assorted screens,
10. Skilled manpower may include but not limited to	<ul style="list-style-type: none"> • Masons • Plumbers • Electricians • Painter • Carpenter • Welders and fabricators
11. Ancillary units may include but not limited to	<ul style="list-style-type: none"> • Back-up power supply, • Fish feed Stores • Office • Water storage tanks • Filtration facilities • Pump house • Generator room • Staff houses • Equipment stores
12. Portable components may include but not limited to	<ul style="list-style-type: none"> • Plastic tanks • Aeration equipment • Filters • Water pumps • Water heaters
13. Basic civil works may include but limited to	<ul style="list-style-type: none"> • Landscaping • Walkways • Gate installation • Parking area • Perimeter fencing • Access roads

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment
- communication
- Training
- Use of tools and equipment
- Measurement
- Drawing and sketching
- Communication
- Basic first aid
- Interpretation of simple hatchery design
- Masonry
- Basic plumbing
- Budgeting
- Plumbing

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards
- Hazard Analysis Critical Control Points (HACCP)
- Regulatory bodies/ Competent authorities
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- National legislations and regulations
- Types of tools, equipment and PPEs
- Budgeting
- Microbiology
- Basic chemistry
- Water quality
- Water filtration mechanisms
- Disease causing pathogens
- RAS design, layout and construction

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> 1.1 Developed RAS food safety risk management plan 1.2 Identified a suitable location for the RAS facility
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	<ul style="list-style-type: none"> 1.3 Determined the required components and supporting systems of the RAS system 1.4 Designed a functional layout of the RAS facility 1.5 Designed a workable filtration and waste disposal system 1.6 Prepared Bills of Quantities and worked out RAS cost estimates 1.7 Supervised construction of RAS facility and installation of functional parts 1.8 Set up an environmentally friendly waste disposal system 1.9 Installed biosecurity structures 1.10 Tested RAS system components singly and collectively for defects and rectified accordingly. 1.11 Cleaned and disinfected RAS facility as per the standard sanitary operating procedures 1.12 Disposed of wastes from the RAS system according to NEMA regulations 1.13 Screened visitors, equipment and materials entering the RAS facility.
2. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace or assessment location 2.2 PPEs 2.3 Tools, equipment and materials 2.4 Pond construction materials 2.5 Building materials 2.6 Writing materials
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Projects 3.4 Written tests 3.5 Portfolio of Evidence 3.6 Interview 3.7 Third party report
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4. 1 On-the-job 4. 2 Off-the –job 4. 3 During Industrial attachment

5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.
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MANAGE FISH CAGE FARM

UNIT CODE: AQ/OS/AT/CR/08/6/B

UNIT DESCRIPTION

This unit specifies the competencies required to manage fish cage farm. It involves conducting fish cage farm site Food safety risk assessment, developing fish cage farm site food safety risk management plan, designing cage farm layout, setting up and configure cages in a water body, stocking cages with fish, managing fish feeds and feeding, managing fish stock health, controlling theft and vandalism, predators and intrusive animals, harvesting fish stock, maintaining cages and prevent escapes, and evaluating fish cage farm set up.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct fish cage farm site food safety risk assessment	1.1 Fish cage farm site and riparian land <i>hazards</i> are identified and documented. 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination are identified based on <i>use of the riparian land</i> . 1.3 Level of risk is assessed and established as per manual standard operating procedures
2. Develop fish cage farm site food safety risk management plan	2.1 <i>Preventive measures</i> for fish cage farm site hazards are established as per identified source of contamination and manual standard operating procedures 2.2 Standard operating procedures for correcting and preventing fish cage farm site risks are developed based on the identified risks/ <i>hazards</i> . 2.3 Fish cage farm site food safety status is evaluated based on statutory requirements and standards 2.4 Risk is communicated as per policies for internal and external communication 2.5 Approval and certification of fish cage farm site is sought from relevant certification bodies based on <i>statutory requirements</i> and standards
3. Design cage farm layout	3.1 Baseline survey is conducted to select cage farming site based on its suitability and food safety risk assessment

	<p>3.2 Cage management plan is prepared in compliance with food safety risk management plan and environmental regulations</p> <p>3.3 Fish cages and ancillary farm structures are designed in accordance with scale of operation, environmental considerations</p> <p>3.4 Cages set up costs are worked out based on client's budget.</p> <p>3.5 Tools, equipment, materials and supplies are identified and gathered based on job requirements.</p> <p>3.6 Statutory requirements are established and necessary permits acquired from relevant authorities.</p>
4 Set up and configure cages in a water body	<p>4.1 PPEs are identified and gathered as per task requirement</p> <p>4.2 Safety precautions are adhered to in line with Occupational Safety and Health Policy Guidelines.</p> <p>4.3 Tools, equipment and materials are assembled in line with task requirement</p> <p>4.4 Cages are assembled onshore according to instructions in the user manual</p> <p>4.5 Assembled cages are set up at the approved site following design specifications</p> <p>4.6 Ancillary structures are constructed or installed based on the farm design specifications</p> <p>4.7 Predator control devices are installed as per best management practices</p>
5 Stock cages with fish	<p>5.1 Stocking plan is prepared as per the capacity of the culture units to be stocked</p> <p>5.2 Number of required fingerlings is calculated based on number and size of cages, and stocking densities</p> <p>5.3 Stocking order of cages is determined based on the stocking plan</p> <p>5.4 Fingerlings are sourced from approved hatcheries</p> <p>5.5 Fingerlings are transported to the cage farm under controlled temperatures and aeration.</p> <p>5.6 Fingerlings are quarantined in specially designated tanks onshore</p> <p>5.7 Fingerlings are acclimatized based on water temperatures inside respective cages</p> <p>5.8 Fingerlings are gently released in to cages as per the stocking plan</p> <p>5.9 Stocked cages are monitored for fingerling stress and mortalities through direct observations</p>
6 Manage fish feeds and feeding	<p>6.1 Tools, equipment and materials are assembled in line with task requirement</p> <p>6.2 Fish feeding schedule is developed based on the cultured fish species</p>

	<p>6.3 Fish are fed as per the feeding schedule using appropriate method</p> <p>6.4 Fish feed consumption is monitored and appropriate actions taken based on prevailing weather conditions and fish behavior</p> <p>6.5 Feeding ration adjustments are calculated based on results from periodic fish sampling and weight measurements</p> <p>6.6 Feeds supplies are handled and stored according to manual of standard operating procedures</p> <p>6.7 Accurate feeding, fish biomass and inventory records are maintained according to work place requirements</p> <p>6.8 A comprehensive stress-management program is developed and implemented</p> <p>6.9 Water quality parameters are monitored and remedial measures undertaken in accordance with target species optimum ranges</p>
7 Manage fish stock health	<p>7.1 Fish are checked for signs of stress and disease based on physical appearance and behavioral changes</p> <p>7.2 Remedial measures for stressed and diseased fish are undertaken as per Food and Agriculture Organization (FAO) guidelines</p> <p>7.3 Water quality parameters are monitored and remedial measures undertaken in accordance with target species optimum ranges</p> <p>7.4 Biosecurity measures are put in place to prevent disease outbreaks in compliance with Public Health Act (CAP 242)</p> <p>7.5 Biosecurity plan and biosecurity agreements with neighboring cage farms developed based on the Animal Diseases Control Act (CAP 364) and Kenya Veterinary Policy (2015)</p> <p>7.6 Drugs and chemicals are handled, stored, and disposed of according to standard operating procedures</p>
8 Control theft and vandalism, predators and intrusive animals	<p>8.1 <i>Fish predators and intrusive animals</i> are identified</p> <p>8.2 <i>Control measures</i> for predators and intrusive animals are put in place</p> <p>8.3 Measures are put in place to minimize theft and vandalism</p>
9 Harvest fish stock	<p>9.1 <i>Harvesting plan</i> is prepared as per the identified market demand</p> <p>9.2 <i>Harvesting tools, equipment and materials</i> are assembled in line with task requirement</p> <p>9.3 Harvesting of fish is carried out using appropriate equipment and techniques</p> <p>9.4 Harvested fish is sorted according to size and species</p>

10 Maintain cages and prevent escapes	<p>10.1 Maintenance tools, equipment and materials are assembled as per the task requirements</p> <p>10.2 Cages are checked at intervals for signs of damage, tear and wear, and repairs or replacements done.</p> <p>10.3 Farm security plan is developed and implemented</p> <p>10.4 Cages are secured using appropriate anchoring techniques</p> <p>10.5 Cages are cleaned onshore using appropriate cleaning techniques</p>
11 Maintain records	<p>11.1 Different types of records are maintained based on the scale of the farm</p> <p>11.2 Records are reviewed regularly to provide insights into opportunities for improved operations</p>
12. Evaluate fish cage farm set up	<p>12.1 Fish cage farm set up is evaluated based on food safety standards</p> <p>12.2 Fish cage farm set up is approved for compliance to statutory requirements by relevant authorities</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical • Chemical <ul style="list-style-type: none"> ○ Bio-accumulation of heavy metals ○ Agricultural chemicals ○ Industrial chemicals • Microbial <ul style="list-style-type: none"> ○ Viruses ○ Bacteria ○ Parasitic worms and protozoa • Naturally occurring toxins
2. Sources of hazards may include but not limited to:	<ul style="list-style-type: none"> • Soil erosion/ Runoff • Toxic aquatic plants • Fecal matter • Industrial effluents • Agricultural effluents

3. Use of riparian land may include but not limited to:	<ul style="list-style-type: none"> • For animal feeding or domestic animal production; • As a waste disposal site (garbage or toxic industrial waste) • As a sanitary waste management site • For mining activities, oil or gas extraction • For former agricultural activities
4. Preventive measures may include but not limited to:	<ul style="list-style-type: none"> • Establish cages in recommended sites • Personnel hygiene and health
5. Statutory requirements may include but not limited to:	<ul style="list-style-type: none"> • Compliance to standards and regulations • Kenya Fisheries Service • County Government • The Fisheries Management and Development Act No.35 of 2016. • The Codex Alimentarius Food Hygiene Basic Texts; • The Food Drugs and Chemical Substances Act Cap. 254 of the Laws of the Kenya; • The Pest Control Products Act, Cap. 346 of the Laws of Kenya; • The Public Health Act, Cap. 242 of the Laws of Kenya; • The Environmental Management and Co-ordination Act, 1999.
6. Ancillary structure may include but not limited to:	<ul style="list-style-type: none"> • Supplementary aeration, dip nets, screens, automatic feeders, demand feeders, screens, containers, ramps
7. PPEs may include but not limited to:	<ul style="list-style-type: none"> • Safety goggles, gum boots, helmets, gloves, dust coats, first aid kits, industrial mouth piece, life jackets
8. Tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> • Measuring tape, weighing scale, DO meter, pH meter, ammonia test kits, Supplementary aeration, dip nets, screens, automatic feeders, demand feeders, screens, containers.
9. Stocking plan may include but not limited to:	<ul style="list-style-type: none"> • Species of fish, stocking density, source of fingerlings, stocking schedule
10. Fish predators and intrusive animals may include but not limited to:	<ul style="list-style-type: none"> • Birds, mammals, reptiles, amphibians, invertebrates,

11. Control measures may include but not limited to:	<ul style="list-style-type: none"> traps and scarecrows, cover net, twines, Predator nets, acoustic deterrence devices, visual deterrence devices, dogs as a deterrent
12. Harvesting plan may include but not limited to:	<ul style="list-style-type: none"> Quantities to harvest Time of harvest Size to harvest Culture unit to harvest Partial or complete
13. Harvesting tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> Seine net, scoop net, buckets, laundry baskets, weighing scale, perforators, boat
14. Maintenance tools, equipment and materials may include but not limited to:	<ul style="list-style-type: none"> Scrubbing brush, paint brush, anti-corrosive paints, pressure washer
15. Records may include but not limited to:	<ul style="list-style-type: none"> Feeding, inventory, fish movements, operations (stocking/harvesting), chemical use, water quality (e.g. Temperature and Dissolved Oxygen)

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Use of tools and equipment
- Food safety risk assessment and communication
- Training skills
- Measuring
- Fish handling
- Record keeping
- Fish feeding
- Predator control
- Fish harvesting
- Communication
- Basic first aid
- Numeracy
- Swimming and diving
- Conflict resolution

Required Knowledge

The individual needs to demonstrate knowledge of:

- Codes of Practice
- Hazard Analysis Critical Control Points (HACCP)
- Food Safety Hazards in Aquaculture
- Good aquaculture practices
- Good hygiene practices
- Safety precautions
- Principles of food hygiene
- National legislations and regulations
- Types of tools, equipment and PPEs
- Fish disease
- Basic fish biology
- Fish feeds and feeding methods
- Water quality parameters
- Fish predators and intrusive animals
- Aquatic weeds
- First aid
- Ecology

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Developed fish cage farm site food safety risk management plan 1.2 Conducted baseline survey to select cage farming site based on specified factors. 1.3 Prepared Cage management plan in compliance with NEMA regulations 1.4 Designed fish cages and ancillary farm structures in accordance with scale of operation, environmental considerations 1.5 Worked out cages set up costs based on client's budget 1.6 Set up assembled cages at the selected site following design specifications 1.7 Installed predator control devices as per best management practices 1.8 Prepared stocking plan as per the capacity of the culture units to be stocked
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	<p>1.9 Calculated number of required fingerlings based on number and size of cages, and stocking densities</p> <p>1.10 Quarantined fingerlings are in specially designated tanks onshore</p> <p>1.11 Acclimatized fingerlings based on water temperatures inside respective cages</p> <p>1.12 Developed fish feeding schedule based on the cultured fish species</p> <p>1.13 Fed fish as per the feeding schedule using appropriate method</p> <p>1.14 Calculated feeding ration adjustments based on results from periodic fish sampling and weight measurements</p> <p>1.15 Undertook remedial measures for stressed and diseased fish as per Food and Agriculture Organization (FAO) guidelines</p> <p>1.16 Put in place biosecurity measures to prevent disease outbreaks in compliance with Public Health Act (CAP 242)</p> <p>1.17 Put in place Control measures for predators and intrusive animals</p> <p>1.18 Carried out harvesting of fish using appropriate equipment and techniques</p> <p>1.19 Checked cages at intervals for signs of damage, tear and wear, and repairs or replacements done</p> <p>1.20 Cleaned cages onshore using appropriate cleaning techniques Maintained Different types of records based on the scale of the farm</p>
<p>2. Resource Implications</p>	<p>The following resources must be provided:</p> <p>2.1 Workplace or assessment location</p> <p>2.2 PPEs</p> <p>2.3 Tools, materials and equipment</p> <p>2.4 Writing materials</p> <p>2.5 Calculator</p>
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral questioning</p> <p>3.3 Projects</p> <p>3.4 Written tests</p> <p>3.5 Portfolio of Evidence</p> <p>3.6 Interview</p> <p>3.7 Third party report</p>

4. Context of Assessment	Competency may be assessed: 4. 1 On-the-job 4. 2 Off-the –job 4. 3 During Industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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